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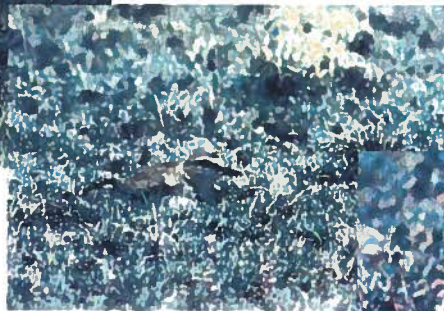
LAWRY SAGER



Endangered Species Program
New Mexico Dept. of Game and Fish
Santa Fe, NM
Contract 95 - 516 - 66
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ABSTRACT

The Mountain Plover is a North American endemic that typically nests on arid shortgrass and disturbed prairie habitats of the western Great Plains. In New Mexico, the species has been reported to breed in 18 counties since first recorded in 1855, primarily on either grazed or ungrazed grasslands where blue grama and/or buffalo grass predominate. The Mountain Plover is a high priority species of concern in New Mexico, and a U.S. Fish and Wildlife Service Category 1 species.

My 1995 survey was undertaken to determine the seasonal distribution and status of Mountain Plovers, characteristics of the birds' habitat, and potential threats to their reproductive success in New Mexico. The survey made use of New Mexico Dept. of Game and Fish files to identify probable plover locales. The survey was primarily a road-based, point-count effort that covered over 9300 miles of New Mexico's unimproved roads, roughly one-third of which represented repeat visits. The greatest survey effort was in the northern half of the state, where I spent about 500 hours covering historic Mountain Plover sites and habitat judged suitable for the birds. I spent four field days and about 50 hours in New Mexico's southern counties in 1995. A total of 152 presumed breeding plovers were reported at 35 sites during the April-July nesting season in 11 of the state's 33 counties by several observers. Additionally, 26 juveniles were at nine sites in eight counties. No Mountain Plovers were reported south of 34 degrees North Latitude with the exception of a non-breeding adult at the Lordsburg Playa, Hidalgo County.

Mountain Plovers were discovered in a variety of habitats in terms of topographic characteristics and plant assemblages. Bare ground was a common feature at all sites. It appears that, in New Mexico, livestock grazing may provide this necessary component of the birds' breeding habitat. Only six plover sites (17.1%) were located in or around prairie dog towns.

During the fall migration, a single-day count on 21 August at two turf farms (Los Lunas in Valencia County and Moriarty in Torrance County) tallied a total of 218 Mountain Plovers of undetermined age classes. On 24 August, a survey of northeastern sites recorded an additional 146 birds at two of them, bringing the total number of plovers reported 21-24 August to 364. Mountain Plovers were present in fluctuating numbers at the turf farms through 9 October.

Several factors often suggested as contributing to the apparent decline of continental Mountain Plover numbers and range contraction elsewhere, such as conversion of rangeland to agriculture, urbanization, and surface mining disturbance did not appear to be immediate limiting factors in New Mexico in 1995.

INTRODUCTION

This report is a summary of a 1995 survey of historic and potential breeding habitat, as well as migration staging sites, of the Mountain Plover (*Charadrius montanus*) in New Mexico. The survey was conducted under contract with the New Mexico Department of Game and Fish. The study was undertaken to assess the Mountain Plover's current breeding distribution and seasonal status, its habitat affinities, and possible threats to its breeding success throughout the state.

An apparent decrease in the numbers of these birds was noted as early as 1915 by Cooke (in Graul and Webster 1976), with market gunning and fragmentation of breeding habitat the suggested factors in their decline. Subsequent reporters suggested a declining trend both in numbers of birds and in the extent of historic breeding range, while more recent concern has focused on environmental factors affecting the animals on their wintering range as well (Knopf and Rupert 1995). Concern for the well-being of the Mountain Plover led the U.S. Fish and Wildlife Service to place the species in its Category 1 in 1993. In New Mexico, the plover is a high priority species of concern (Mehlman and Williams 1995).

The Mountain Plover is an aridland species of the family Charadriidae that is endemic to North America. It is typically associated with the shortgrass prairies of the Great Plains east of the Rocky Mountains, where blue grama grass (*Bouteloua*

gracilis) and/or buffalo grass (*Buchloe dactyloides*) are the predominate plant cover species. In New Mexico, such shortgrass habitat exists in both extensive areas and smaller tracts virtually statewide, albeit with differing plant community composition in the widely spaced geographic regions.

The species breeds from southern Alberta and northern Montana south through eastern Wyoming, western Nebraska, Colorado and western Kansas to New Mexico (A.O.U. 1983). It winters from the lower elevations of California's Central Valley southward onto Mexico's Northern Plateau and at least as far as Baja California Sur in the west and Tamaulipas in eastern Mexico (Knopf and Rupert 1995). Occasionally, small numbers of wintering plovers are found in Arizona and Texas. Actual migration routes are undetermined (Knopf and Rupert 1995).

Spring migrants usually return to New Mexico in early March, and some plovers initiate nesting by early April. Breeding activity may continue well into July, as I saw downy chicks in the vicinity of fully fledged young on 12 July. It is not known if such late chicks represent renesting attempts or second clutches.

In New Mexico, Mountain Plovers were first reported from eastern San Miguel County in 1855, where Mr. Henry reported them as "common" (Bailey 1928). Through the remainder of that century, Mountain Plovers were sporadically reported at widely scattered sites. During the early decades of this century, the extensive

faunal surveys of J. Stokely Ligon added much to the knowledge of the birds' occurrence and distribution within the state.

Using such historical data, together with Breeding Bird Surveys (BBS) and other contemporary reports available to him, Hubbard (1978) compiled a species account of the Mountain Plover in New Mexico. As he noted, no systematic survey had been carried out, that being one of the reasons he concluded that "...it seems impossible to say whether numbers of plovers have declined between the early and recent periods in New Mexico." Hubbard (1978) did note, however, an apparent contraction in overall breeding range within the state, primarily from the southern counties. The 1995 survey effort was intended, in part, to establish a baseline against which changes in distribution and population numbers may be measured.

METHODS

Prior to the 1995 field season, S.O. Williams III (New Mexico Dept. of Game and Fish), provided me with a compilation of Mountain Plover literature plus selected New Mexico historic Mountain Plover data. These data consisted of maps and results of the eight BBS routes on which the plovers were reported during 1968-1994, with dates and locations, plus similar data from an unofficial BBS conducted 1983-1992. Also included were copies of 31 breeding record cards from the period 1864-1994, as well as a by-county summary of data from those cards. Copies of Dr. Williams seasonal extractions of Mountain Plover sightings from raw data submitted by birders and other interested parties

quarterly for the six year period, Fall 1989- Fall 1994, were also provided.

I analyzed the above data by date and location to produce a working list of sites to be visited. The sites were then located and marked on appropriate maps in "The Roads of New Mexico" atlas (1993 edition). Initially, survey routes were planned to maximize coverage of known historic sites plus other potentially suitable habitat around and between sites.

Additionally, I was supplied with about 24 reprints, letters, various agency reports and the NMDGF's BISON-M database for the species, which provided background on Mountain Plover habitat preferences throughout their breeding range. I used this information to assess the suitability of the various habitat types across the state and to identify additional potential breeding areas.

An initial survey protocol was developed, which called for point-count stops of at least five minutes duration every 500m. (approx. 0.3 mile) beginning one mile before each historic Mountain Plover locality and extending a mile beyond. Scanning for plovers at each stop was to be performed from outside the vehicle. The same protocol was to be followed throughout habitat judged suitable for the birds.

In the field, I modified this methodology in response to local conditions, not the least of which was high winds. Subtle changes in topography in the deceptively flat plains offered concealment to the birds, often requiring as many as 10 stops per

mile to survey the area adequately. On open range, walking was often productive. All scanning was performed with 8x40 binoculars.

I spent approximately 572 hours surveying areas of presumed suitable plover habitat during April-October 1995, and covered over 9300 miles of secondary and unimproved roads during that period. Mileage driven on major highways was not included in the above total although stops occasionally were made on such highways statewide, as traffic permitted, in areas of presumed suitable habitat.

Additionally, I recorded observations of two other avian species, Long-billed Curlew (*Numenius americanus*) and Burrowing Owl (*Athene cunicularia*), known to breed on (or in) shortgrass prairie habitats in New Mexico (Appendix A and B). Both are high priority species of concern in the state (Mehlman and Williams 1995). The location and approximate numbers of prairie dogs were also noted but are not included in this report.

The location of each Mountain Plover observation was plotted on the appropriate map. Geographic coordinates were calculated from those points in degrees, minutes and tenths. Elevations were obtained from U.S.G.S. 7.5 minute topographic maps and are given to ± 10 feet.

When possible, I contacted personnel of interested agencies (Bureau of Land Management, U.S. Forest Service, U.S. Army), to notify them of my visits to their region or to lands under their stewardship, and for the exchange of Mountain Plover information.

RESULTS

Spring Migration

Few Mountain Plovers were observed during the spring migration at the two turf farms: "Green Chaparral" in Moriarty, Torrance County and "Grasslands" in Los Lunas, Valencia County, where they have been most consistently reported in the modern era. Six birds at Los Lunas on 10 March and four at Moriarty on 30 March represent the highest single day counts I obtained during spring 1995.

Breeding Season

During the 1995 breeding season (April-July) a total of 152 Mountain Plover adults was recorded at 35 sites by several observers (Table 1). One non-breeding adult from the Lordsburg Playa, Hidalgo County, in June and a single independent bird of the year seven miles south of Springer, Colfax County in July were not counted in the breeding season total. Another nine individuals observed on the northern plains of Taos County on 27 June were not counted because the birds' age classes were not determined.

Overall, the 1995 survey located breeding Mountain Plovers in 11 of New Mexico's 33 counties, with most birds in the northeastern quadrant of the state. Historically, the species has been reported to breed in 18 New Mexico counties.

Elevations of breeding areas located in 1995 ranged from a low of 4810 feet (1466m) above sea level at Site 30 in eastern Harding County to a high of 7970 feet (2429m) at Site 2 in the upper Rio Grande basin of Taos County.

The Mountain Plover is generally considered to be a bird of narrow habitat requirements (Leachman and Odmundson 1990). But how these requirements are met may differ in response to local conditions, e.g., in Colorado's Weld County, Graul and Webster (1976) found the birds nesting on wide flats and playas (roughly circular depressed basins) of predominantly blue grama/buffalo grass, while on a second major breeding ground in Phillips County, Montana, typified by taller grasses, the birds were found breeding selectively on prairie dog towns (Knowles et al. 1982). In New Mexico in 1995, only two (5.7%) of the 35 sites were actually on prairie dog towns, one of which consisted of only a few active burrows. Another four sites (11.4%) were less than one-half mile from various sized prairie dog colonies.

Four sites (11.4%) were at playas which were bare or uniformly grassy depending on local precipitation. As sightings were made at all daylight hours throughout the breeding season, it is likely that the observed habitat usage reflected foraging as well as nesting areas within larger territories.

Windmills and tanks, and associated disturbed surroundings, abound on the plains and are often noted as places where plovers may gather - for shade rather than water. During the 1995 survey,

Mountain Plovers were located at four sites (11.4%) adjacent to windmills and tanks.

Another three sites (8.5%) were located on mesatops within 100m. of the escarpment to plains below.

Two sites (5.7%) were within one-quarter mile of occupied buildings and another two were a like distance from abandoned structures.

Birds were detected almost equally on open range (16 sites) and fenced tracts (19 sites).

Plovers were found in a variety of topographical settings, including steep, short hills and ridgetops, rocky hillsides, barren playas, wide valleys, and thickly vegetated flats (Table 2). But across the varied habitat types that the birds used, the presence of bare ground was common to all. Such ground was found to exist both as the areas between sparse grass clumps and larger, disturbed or naturally occurring barren patches. Another bare ground component common to all sites was the presence of roads. As the 1995 survey was essentially a road-based effort, all Mountain Plover sites were located within one-half mile of roads. Of the 35 sites, six (17.1%) occurred adjacent to paved roads. No vegetation transects were performed on this survey, but studies at two major breeding areas in Colorado and Montana found about 30% bare ground at nest sites (Knopf and Miller 1994). Those authors also suggested that the constancy of the bare ground component across habitats aligns the species more with the habitat preferences of other charadriids ("shorebirds") and

defines the Mountain Plover as a "disturbed-prairie or semidesert" bird rather than an obligate "grassland" species (Knopf and Miller 1994).

A gravelly surface overlying either a loam or sand substrate characterized all sites on this survey irrespective of the various plant communities encountered.

San Juan County.

San Juan County, in the northwest corner of the state, was found to support breeding plovers in 1974 (Tolle 1976), and a concerted effort in 1981 located plovers at six locations in San Juan and adjoining McKinley County (Craig et al. 1985). The species has been reported infrequently in the county since the early 1980's, most often from the Bisti/Tanner Lake region (one bird was reported at Tanner Lake in the summer of 1994 (B. Falvey, pers. comm.)). Five days were spent in that region but no plovers were reported in San Juan County during the 1995 survey.

Taos County.

The upper Rio Grande basin of northern Taos County, on open flats and rolling hills west of the river, was found to support at least 23 breeding adults at three general sites. Two pairs of plovers were observed in the Punche Arroyo area (Site 1) on 4 May (S. DesGeorges & D. Franks). Closer to the Colorado border, a loose flock of nine birds was seen 27 June (C. G. Schmitt) but were not included in my totals as age classes were not determined; however, this sighting led to the discovery of the relatively large (but scattered) population at Site 2.

Historically, Mountain Plovers have been reported in that area since 1916 (Bailey 1928), albeit without detailed locations noted. No plovers were detected at a site west of the Rio Grande on the rim road near Carson where "about half a dozen" were reported 1 June 1994.

Colfax County.

Colfax County accounted for 46 adult Mountain Plovers at 13 sites. These "sites" often were, in the cases of Sites 8,9 and 15, stretches of road along which plovers were located at intervals varying from less than 0.4 miles to over 1 mile. Geographic coordinates of these extended sites are given only for terminal locations. These appear as cardinal compass points within parentheses in Table 1.

Eight Mountain Plovers were observed along the Raton BBS route (Sites 6 and 10) and an additional single bird was also discovered less than two miles from a 1994 record north of the designated route (Site 5).

Three Mountain Plovers were also found atop a mesa about three miles north of Abbott (Site 11), and seven adults (and one nest) were observed by Hart R. Schwarz in an area about five miles south of Abbott, and directly north of Unit 100, Kiowa National Grasslands (Site 12), close by the location where he discovered them nesting in 1994. Another eight plovers were located on an extremely overgrazed flat five and one-half miles east of Site 12 on the evening of 5 July (Site 14). Of this

group, three were identified as adults before failing light rendered further identification unreliable.

Historically, the Farley BBS route yielded Mountain Plovers 1979-82 and 1993-94. In 1995, plovers were located to the west and north of Farley, at an extensive Black-tailed prairie dog (*Cynomys ludovicianus*) colony (Site 16) and along the homogeneous overgrazed shortgrass slopes east of NM 193 (site 15), respectively.

Another nine individuals were observed in Colfax County along a 10 mile stretch of dirt road connecting NM 193 and the town of Capulin (Site 8).

On the Colfax/Union county line road, south of Capulin (Site 9), an additional seven birds were recorded (three in Colfax, four in Union).

Union County.

Union County supported scattered demes of Mountain Plovers, with a total of 36 adult birds noted at eight sites in 1995. The largest group was located along the unpaved "Sofia Road" (Site 19) which lies between the settlements of Mt. Dora and Farley and is about 11 miles SSW of Grenville. A third of the county total was found in this area. Between 75 and 100 Mountain Plovers near the prairie dog town at the western end of this extended site were reported in early fall 1994 (NMDGF files).

The Grenville area yielded eight birds (four pairs) within two miles north, (six) and south(two) of Grenville (Sites 17 and 18).

A mesatop site 14.5 miles west of Clayton and directly north of US 56 (Site 20) had seven adult plovers on 1 June. A 24 September visit to the site yielded 24 birds, which possibly represented local breeding adults and their offspring of the year, but could have been passage migrants from farther north.

In recent years, the northeastern corner of New Mexico has been considered by some (e.g., Graul and Webster 1976) to be the stronghold of the species within the state. The first breeding in Union County, however, was not recorded until 1966 (NMDGF files).

Since the 1970's, Mountain Plovers have been reported yearly at various sites in the area around Clayton, mostly by Wes Cook, who located a pair about two and one-half miles north of the city in July 1995 (Site 23). In June 1995, a single calling bird was detected about five miles south of Clayton on Unit 27, Kiowa National Grasslands and there was an unconfirmed report of a plover on Unit 147 of the grasslands at the eastern edge of the city.

McKinley County.

The Torreon BBS in McKinley County recorded a single Mountain Plover in 1977 and up to four adults were reported in that general area in subsequent years through 1982 (B. Falvey, pers. comm.). On my fourth visit to this shortgrass flat on the Continental Divide on 22 June a pair of plovers (and one chick) were observed at Star Lake (Site 24). These birds were the only Mountain Plovers reported from McKinley County in 1995.

Sandoval County.

In Sandoval County, five adult plovers were found nesting southeast of the junction of I-25 and NM22 (redesignated "County Road 52A", in December 1995), at a traditional plover site known since at least 1975 (Site 25). This site is at the eastern edge of Santo Domingo Tribal land and adjacent BLM land (a complete nest was located less than 15 feet east of the boundary fence when an adult flew directly to it!). La Majada Mesa, between Santo Domingo and Peña Blanca, where a few nesting pairs were reported in 1922 (Bailey 1928), was surveyed from roadside on three occasions in 1995 with no success. Downy Mountain Plover young were collected in June, 1874 near Algodones, where large tracts of suitable habitat still exist, most of them inaccessible or in tribal or private hands. This condition pertains to the mesatops paralleling I-25 northward to the plains of southern Santa Fe County.

Santa Fe County.

No breeding records of Mountain Plovers exist for Santa Fe County although Bailey (1928) and Hubbard (1970) noted that they summer there. Three calling adults were reported from the White Lakes area in May 1994 (NMDGF files) but no plovers were observed within the county during the 1995 season.

Torrance County.

In Torrance County, the turf farm east of Moriarty (and another at Los Lunas, Valencia County) has become an important location, in terms of both plovers and people wishing to see the elusive birds. This is a stopover and staging area used by

Mountain Plovers during spring and fall migrations, with larger numbers typically reported during the latter period. Three nests were reported to me as being found on the farm during a single season in the early 1990's (W. Webb, pers. comm.), but photographs obtained at that time to substantiate the report could not be located.

Elsewhere in Torrance County, Mountain Plovers have been described in the past as breeding over limited areas (Hubbard 1978). A dozen or more birds were reported in May 1917 west of Encino, most likely in the vicinity of the "Lulu" ("Lulu"= Lucy?) railroad stop (Bailey 1928). A specimen in breeding condition was taken two miles east of Encino on 18 April 1962 (Museum Southwestern Biology, UNM). Hubbard (1978) cites a few occurrences of the birds in a larger area encompassing eastern Torrance County during 1952-1972. No breeding plovers were encountered in the county during this survey.

Guadalupe County.

Although there are no historic breeding records for the species in Guadalupe County and none were reported during 1995, two adults were collected east of Santa Rosa on 17 May 1993 (Museum Southwestern Biology, UNM).

Mora County.

In Mora County, 10 Mountain Plovers were detected at two sites. One of these (Site 26), was immediately west of I-25 on the Fort Union Ranch, in the area where in June 1991 the birds were "widespread... in small numbers..." (NMDGF files). A single

plover was reported "near Watrous" in June 1992 (NMDGF files); Watrous is approximately eight and one-half miles SW of Site 26 where I discovered six adults during an April snowstorm and relocated them again on subsequent visits. The second site (Site 27), is on a discontinued BBS route (Wagon Mound BBS) south of Wagon Mound where plovers were reported from 1970-74 and 1976-78. I observed four birds at one location on this route 10 June 1995.

Harding County.

In 1995, nine Mountain Plovers were reported in this county at three general sites. At Chicosa Lake State Park (Site 28), a single plover was observed on 8 June (W. R. Maynard) and the same (or another) bird was seen there by me on 5 July. A Mountain Plover was recorded there on 7 June 1990 (NMDGF files). Two pairs of the birds, each pair accompanied by three fledged young, were observed about six miles SSW of Yates alongside NM 120 (Site 29). Within three miles of the Union County line in eastern Harding County, four adult plovers were located on 9 June 95 at three stops (Site 30) on the Rosebud BBS route by W. R. Maynard.

San Miguel County.

Mountain Plovers were first noted in San Miguel County in 1855 by Mr. Henry, who found them "common" (Bailey 1928). In 1898, Mitchell found them "breeding still" in the eastern portion of the county. The Pablo Montoya Grant (Bell Ranch) that comprises most of eastern San Miguel County was not covered by the 1995 survey.

Four plover were located 2.2 miles north of NM 104, about 17 miles east of Las Vegas on the overgrazed plains and wide playas (Site 31). This site is in the area of an unofficial BBS route whereon Mountain Plovers were recorded by J. P. Hubbard from 1985-87 and 1989-92 (the last year of the survey). Site 31 is approximately 17 miles south of the Fort Union Ranch (Site 26) in Mora County.

Cibola County.

The Fence Lake BBS in Cibola County yielded seven Mountain Plovers at five stops along six miles of NM 117 on 18 May prior to the formal BBS (S.O. Williams III). The first breeding record in this area is from 1968 (NMDGF files). Plovers were recorded on the Fence Lake BBS in 1975, 1978, 1980 and 1994.

I found three adults on 22 June 1995 at two sites on the BLM's "Chain of Volcanoes" road (Cibola Co. route 42) (Site 33). This is the area in which the "North Plains" end and the playas and scattered lava outcroppings of El Malpais begin.

Catron County.

Historically, the San Agustin Plains of Catron and Socorro counties, west of Magdalena, have been known as a "regular breeding area", nesting "rather abundantly" in 1915 (Bailey 1928). Mountain Plovers were reported between Red Hill and the Arizona border in the western reaches of Catron County in 1977, with nesting confirmed the following year (Johnson and Spicer 1981). Neither this area nor a 1940 nesting area southwest of Old Horse Springs were found to support breeding plovers in 1995.

Socorro County.

Six plovers were located in Socorro County within three miles of Catron County. These birds were found on the Datil BBS route, south of US 60 and west of the National Radio Astronomical Observatory's Very Large Array (VLA) site. Plovers had been recorded on this BBS route north of US 60 in both 1993 and 1994. A worker at the VLA told me that the birds nest during some years (no dates given) on a dirt road, closed to the public, that runs from the VLA "hangar" north about two miles to US 60. With his hand he reproduced the nest scrape and placement of the three eggs of a complete Mountain Plover clutch in the dirt. (The related Killdeer (*Charadrius vociferous*) which also nests locally usually lays a clutch of four eggs).

Lincoln county.

A single adult plover with two fledged young discovered on the Corona East BBS on 11 June 1995 by David Mehlman furnished the first Lincoln County breeding record for the species. This site (Site 35) in the northern part of the county, is one of heavily and actively grazed (by sheep as well as cattle) shortgrass prairie with scattered yucca and cholla.

Hidalgo County.

In the Animas Valley of Hidalgo County Mountain Plovers were reported as breeding "quite commonly" by Ligon in 1926 (Bailey 1928) and a nest record exists from 1933. Three birds were observed on the Lordsburg Playa in June 1990 and another bird

(possibly a migrant) was reported on 14 March 1992 at the Gray Ranch further south. Regular early June surveys for breeding birds in grasslands in the southern Animas Valley since 1987 have not detected any Mountain Plovers.

In 1995 a single non-breeding adult was reported from the Lordsburg Playa 6 July (J. Oldenettel).

Otero County.

In Otero County, no Mountain Plovers were reported during 1995. Parts of Otero Mesa, on Fort Bliss military reservation's McGregor Range, was surveyed by U.S. Army personnel without success (B. Locke, pers. comm.). This is the mesa country south of the Sacramento Mountains where the species was reported as nesting in 1912 (Bailey 1928) and subsequently described as one of their most extensive breeding grounds by Ligon (1961). In May 1980, a Mountain Plover was observed in the Shiloh Hills allotment in the Tularosa Valley about 15 miles north of the Texas border (B. Locke, pers. comm.).

An adult bird with two chicks was reported from the Holloman Lake area south and west of Alamogordo 27 June 1987 (NMDGF files). Five plovers recorded at Holloman Lake 19-26 September 1992 were most likely migrants.

DeBaca, Chaves, and Lea Counties.

No Mountain Plovers were reported in 1995 from three southeastern counties with previous breeding records: DeBaca (south of Yesso, 1968), Chaves (south of Kenna, 1924 and south of Roswell, 1966), and Lea (northeast of Tatum, 1926). Survey effort

in this portion of the state was limited to a single two day visit.

In Chaves County. Mountain Plovers were reported on the Roswell BBS route in 1968 and 1977 but have not been found there since. They were also reported nesting in the 1960s at locations west of the Roswell Industrial Air Center (Montgomery 1969) in an area that currently lies behind locked gates.

In addition to his 1926 breeding record for the species northeast of Tatum, in Lea County, Ligon reported "quite a number" of the birds between Tatum and Caprock in June of the same year (Bailey 1928). Ligon (1961) also reported approximately 150 plovers on 3 July 1937 northeast of Tatum. In more recent times, a pair was observed regularly over a period of "about a week" during the spring of 1983 between Tatum and Milnesand (B. Locke, pers.comm.).

Fall Migration

Fall migrants were observed at four sites: the turf farms at Moriarty and Los Lunas, and in Colfax County west of Farley (Site 16) and in Union County 14.5 miles west of Clayton (Site 20). The highest single day counts were tallied. On 21 August, the two turf farms accounted for 218 plovers of both age classes: 125 at Moriarty and 93 at Los Lunas. A survey of the two northeastern sites on 24 August found 122 birds at Site 16 and 24 birds at Site 20, totaling 146 plovers. Hence, these four sites yielded a total of 364 Mountain Plovers 21-24 August.

Little is known of "turnover rate" of migrants at staging areas such as the turf farms; consequently, the 250 plovers I counted on 3 September (108 at Los Lunas and 142 at Moriarty) could not be counted as "new" with confidence. If, however, the plovers observed on 3 September were new arrivals, replacing those observed on 21 August, the possible number of fall migrants was in excess of 600 birds.

The same number of birds (142) was counted again at Moriarty again on 17 September. But on 20 September, no plovers were seen at Los Lunas, on a day when the odor of chemicals was pervasive on the fields. On 9 October, however, another 25 Mountain Plovers were reported there (A. Eisner). This report was the last of the 1995 season, as no plovers were reported from Moriarty after 3 October. No banded birds were observed among any of the fall migrants.

DISCUSSION

Distribution and Occurrence.

Almost seventy years ago Ligon anecdotally reported Mountain Plovers in New Mexico as "fairly common in widely separated sections of the State." (Bailey 1928). Today, this assertion is still apt, but with slight modification. The discovery of at least 152 plovers across the breadth of a state as large as New Mexico, where I estimate 20%, (roughly 20,000 sq. mi.,) may be potential breeding habitat should preclude the assumption that the birds are "fairly common." However, their clumped distribution, plus a tendency to nest in a loosely colonial

fashion both here and throughout their range, lends some support to this description.

In 1995, as in previous years, Mountain Plovers were found to occupy sites in widely separated sections of the state but not, apparently, as widespread as Ligon believed them to be. In 1995, no breeding Mountain Plovers were observed south of 34 degrees North Latitude; this excludes most of the southern half of the state, where my efforts were limited to four field days in 1995. Negative survey results in that part of the state seems to echo Hubbard's (1978) observation that the overall breeding range of the plover may have declined, to where it was seemingly "less extensive in New Mexico than in the past." However, with only eight Mountain Plover breeding records over a period of almost a century and a half, it is likely that southern New Mexico (and, indeed, much of the state's shortgrass habitat) may represent only marginally acceptable conditions to the birds. The apparent but unproven reduction in Mountain Plover breeding range in New Mexico may be a reflection of the supposed continental population decline, or a response to subtle climatic or other abiotic trends. It is more likely, however, that given the paucity of breeding records statewide, New Mexico has been, and continues to be, at the southern fringe of regular plover nesting, that geographic limit being poorly defined and variable. It may be that environmental conditions, such as weather and prey availability during the breeding season, may not differ between wintering range and this state's southern counties to a degree

that such a relatively short migration (less than 800 mi. from its most distant known wintering area) is more advantageous to the birds than a longer journey.

But because the occurrence of Mountain Plovers is "somewhat sporadic" (Ligon 1961) and the birds may change locations from year to year (Leachman and Osmundson 1990), future surveys should not neglect the southern section of the state. Likewise, historical sites that were not productive in 1995 (e.g. in San Juan County) may prove to hold plovers in future surveys, as some degree of site fidelity, if not site tenacity, has been found in Mountain Plovers breeding in Colorado. In Colorado, at least some adults of both sexes and some chicks return to nesting and natal areas respectively (Graul 1973). Studies in Wyoming found that some Mountain Plovers would use an area for several years, then abandon it for a year or more, with some plovers subsequently returning to the area after that absence (Oelklaus 1989, in Leachman and Osmundson 1990). Similar patterns in other shrubsteppe bird communities were noted by Rotenberry and Wiens (1980, in Leachman and Osmundson 1990), most often when a bird population was below the carrying capacity of available habitat, a condition that appears to exist for Mountain Plovers in New Mexico. If this behavioral pattern is shared by New Mexico plovers, apparently sharp increases or declines at specific sites, as has been the case on several BBS routes, may be expected, while a census of a larger area encompassing the sites might be expected to demonstrate more stable population numbers.

Possible Threats

The factors attributed to the retraction of Mountain Plover breeding distribution from extensive regions of the Great Plains, such as conversion of habitat to agriculture, "pitting", urbanization, and surface mining, may not be serious limiting factors in New Mexico.

Agricultural Conversion.

Conversion of plover habitat to agricultural uses has occurred for the most part in the eastern and southeastern sections of the state, and to some degree in the Animas Valley of southwestern New Mexico. But with low population numbers plus a demonstrated willingness to shift nesting locations, along with ample alternative habitat available, it would appear that any displaced birds should find acceptable sites nearby.

Pitting.

"Pitting", the practice of scarifying or gouging the earth by machine in order to retain soil moisture and thereby promote growth of taller vegetation, was not observed during the course of this survey nor was evidence of past pitting noted.

Mining.

Surface mining has been implicated in the reduction of plover habitat elsewhere (Dinsmore 1983, in Leachman and Osmundson 1990) but does not appear to be a significant limiting factor in New Mexico, where there is little overlap of coal recovery areas and plover habitat. Strip mining of coal still occurs in San Juan County, but it is mostly well north of plover

records there. I believe the adverse effects of mining, beyond that of actual habitat loss or disturbance, may be overstated. Mountain Plovers in Wyoming's Converse County demonstrated a positive bias towards the Antelope Coal Mine (Oelklaus 1989, in Leachman and Osmundson 1990) and no difference in behavior was noted by Parrish (1988, in Leachman and Osmundson 1990) between birds distant from a mine and birds within 0.52 km. of the mine pit.

Past sand, gravel and gypsum recovery operations along the I-25 corridor, from Bernalillo County northward to Santa Fe County, may have actually enhanced some habitat. By leveling mesatops and filling adjacent arroyos, enlarged areas of gravelly ground, where plants are slow to colonize, are produced. Once abandoned by industry, these sites may provide "islands" of suitable habitat.

Petroleum Production.

Oil and gas production fields may provide (or, at least, not preclude) suitable plover habitat at some locations. The first documented record of nesting Mountain Plovers in Utah was approximately 60m. from a producing well, and additional plovers were observed on and around well pads and dirt access roads (Day 1994). With this information in mind, my survey paid particular attention to well pads and surrounding disturbed ground, but I found no plovers at such sites. Petroleum wells are common in the northwestern corner of the state, and are abundant in the southeastern counties. There, the maze of wells and roads, while

providing easy access to potential plover habitat, is nonetheless daunting due to the scope of the industry. Adequate coverage of the area will require more than the single day that I spent there in 1995.

Urbanization.

At first glance, the urbanization of New Mexico does not seem to be an immediate threat to plover habitat availability or reproductive success. The effects of past intrusions onto plover habitat have not been documented. My survey found conversion to residential usage at or near only two historic sites: east of Bernardo in northern Socorro County where two Mountain Plovers were reported during the week of 6 June 1992, and the White Lakes area of southern Santa Fe County where up to three plovers were present 28 May 1994.

In Socorro County, the sloping rangeland on both sides of US 60 east of Bernardo and the Rio Grande has been subjected to patchy development in recent years, as individuals have fenced land parcels and constructed or installed housing and outbuildings. In Santa Fe County, this patchy pattern, as well as more concentrated development, has accelerated in recent years and there are ongoing discussions concerning the paving of county roads. The pace and magnitude of development in the southern part of Santa Fe County is such that the formation of a new county in the Edgewood area has been proposed. During my survey, six new dwellings were erected in a three week period in habitat judged suitable for plovers, this along NM 472 west of Stanley. This

pattern is being repeated to some extent throughout the county on lands surrounding the few large ranches.

Although judged as probably suitable habitat, these areas are not known to be regular nesting grounds for the species, but inroads (and new roads) onto this finger of the plains may yet reveal previously undetected plover sites.

The direction and density of urbanization is difficult to predict, and its threat to plovers and their habitat will require close monitoring and assessment. As the birds appear little disturbed by human structures and activities, the larger threat to plovers, and other ground nesting birds, may come from the introduction of predatory domestic cats and dogs and the "campfollowers" of urban sprawl-- skunks, foxes, and raccoons.

Predation.

Little interspecific activity, other than that between plovers and myself, was observed during the 1995 survey. However, several potential predators of Mountain Plovers and their eggs were observed in close proximity to plover sites. A Striped Skunk (*Mephitis mephitis*) at Site 19 in Union County was actively hunting well after sunup. An adult Swift Fox (*Vulpes velox*) with 4 young was found at a burrow about six miles north of Site 20, also in Union Co.

Both Ferruginous Hawks (*Buteo regalis*) and Golden Eagles (*Aquila chrysaetos*) were observed on or over Sites 15 and 16 near Farley, and an immature eagle was salvaged beneath a power pole at the prairie dog town there, but these avian predators were

likely hunting prairie dogs. The Ferruginous Hawks observed in the vicinity of seven northeastern sites and Site 34 in Socorro County produced no noticeable effects on plover behavior.

At Site 2, in northern Taos County, the sound of a stooping Prairie Falcon (*Falco mexicanus*) caused me to look away from a pair of distracted Mountain Plovers in time to see the falcon streak past clutching what appeared to be a downy chick. Unfortunately, my observation could not be confirmed because the falcon was quickly lost to sight beyond a nearby hill.

Thirteen-lined Ground Squirrels (*Spermophilus tridecemlineatus*) were also reported in the vicinity of Site 2 (C. G. Schmitt, pers. comm.) and were commonly active in the vicinity of plover sites across the northeastern counties. Graul (1975) observed one of these squirrels taking a plover egg at a Colorado site, but predation, or evidence of their predation, was not obvious at any site in New Mexico in 1995.

The northeastern section of the state is also home to another potential aerial predator, the Loggerhead Shrike (*Lanius ludovicianus*), but although shrikes were observed on a daily basis none were seen near plover sites. It should be noted that both the Loggerhead Shrike and Ferruginous Hawk are considered as species of concern in New Mexico.

Pesticides.

Among chemical contaminants, pesticides pose a double-edged threat to the insectivorous Mountain Plovers. The birds may be directly affected by ingestion of these toxic materials,

depending on their concentration in the environment, and may also suffer due to a drastic reduction of food supplies. Grasshoppers, which along with beetles make up the bulk of plover prey (Leachman and Osmundson 1990), were abundant in New Mexico grasslands in 1995, even in the semi-desert conditions of southern Otero Co. The northeastern quadrant of the state also experienced a population explosion of range caterpillars (a buck moth, *Hemileuca oliviae*), but no application nor other evidence of pesticides was noted during the field season.

It appears that, in New Mexico, Mountain Plovers are more likely to come in contact with pesticides on agricultural fields where they are occasionally reported in migration; most recently in the Fort Sumner area in September 1992 (83 birds) (NMDGF files) and on alfalfa fields near Otis in September 1994 (22 individuals) (NMDGF files).

Concentrations of plovers at the two turf farms where they are most commonly reported during migration may also expose the birds to pesticide contamination. Fortunately, it appears that neither of these staging areas are treated with insecticides on a regular basis. At Moriarty, only 40 acres were treated in the last decade (W. Webb, pers. comm.). Both turf farms make use of herbicides on occasion, to control dandelions. Such applications are performed on a rotational basis so that no more than a quarter of the acreage is treated at any one time. Birds, and the domestic sheep kept at both sites, seem to avoid the most recently treated fields (W. Webb, pers. comm.).

Population size.

How many Mountain Plovers are there in New Mexico? Published estimates of about 100 breeding Mountain Plovers in the four-state area of Texas, Oklahoma, Utah, and New Mexico (Leachman and Osmundson 1990) may be overly conservative, and the recording of 152 breeders, or potential breeders, in New Mexico is encouraging. But how well does this number reflect actual population size within the state, and how efficient was the overall survey effort?

Almost 3000 miles (about one-third) of my 1995 survey represented repeat visits to the vicinity of plover sites. This was due to an attempt to evaluate the efficiency of my survey effort. Repeat coverage was not wasted effort however: of the 27 sites visited two or more times, plover counts were increased at seven. Birds were not always detected on first visits; second surveys found plovers at six sites, third visits revealed birds at an additional two sites, and a fourth visit was necessary to locate birds at one site.

More telling, perhaps, is that no plovers were observed after their original sighting at 10 sites, each visited on two subsequent occasions. While this could be dismissed as a result of relaxed coverage once the birds' presence was known, such was not the case. Repeat coverage was often more attentive--knowing that the birds were present stimulated an attempt to locate others in the area, to gain information on territorial fidelity and to ascertain the progress of the breeding cycle.

In Great Britain, a study of the equally cryptic and behaviorally elusive congener, the Dotterel (*Charadrius morinellus*), suggested that an experienced observer making a single visit to a known plover site under ideal conditions will only find about 40% of breeders present. Three visits were required to raise the level of efficiency to about 75% (Galbraith et al. 1993). As these data were collected at previously censused sites on geographically restricted habitat, the information is not directly comparable to the findings of my survey. However, it points out the difficulty of obtaining an accurate site-by-site count of the birds. I believe that this difficulty precludes the possibility of reliable extrapolations of population numbers or nesting density. In New Mexico, further surveys are necessary to achieve a more complete picture of the species status statewide. It is hoped that making the results of the 1995 survey available will stimulate interest in birding activity on the prairies, which might result in far more information than could be obtained in this single season study.

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TABLE 1: By-County numbers and locations of Mountain Plovers in New Mexico in 1995, with geographic coordinates, elevations, site numbers, and corresponding map numbers plus the names of reporting observers.

County	Site No.	Date	Site	Geo. Location	Map #	Elev. (ft.)	# Birds	# Young	Reporter
Taos	1	5/4	Punche Arroyo	36°51.3'N 105°54.3'W	1	7650	4		S.DesGeorges
	"	5/9	Punche Arroyo	"		"	1		LS
	2	6/27	Upper Rio Grande Basin	(E) 36°59.2'N 105°57.6'W	1	7970	(9)*		C.G.Schmitt
	"	7/11	Upper Rio Grande Basin	(W) 36°57.5'N 105°58.1'W		"	10	4	LS
	3	7/12	W. of Ute Mt.	36°56.0'N 105°46.0'W	1	7600	8	3	LS
Taos County Totals							23	7	
Colfax									
	4	6/7	Tinaja Exit 1-25	36°39.0'N 104°29.2'W	2	6030	2		LS
	5	6/7	N. of Raton BBS 1.75 mi.	36°37.2'N 104°24.5'W	2	6260	1		LS
	6	6/7	mi. 14 Raton BBS	36°30.8'N 104°20.2'W	2	6500	3		LS
	7	6/7	NM 193, 1.1 mi S. US 64	36°46.3'N 104°15.7'W	2,3	6590	2		LS
	8	6/9	Kiowa	(W) 36°40.4'N 104°08.8'W	3	7000	9	1	LS
	"	6/9	"	(E) 36°43.5'N 104°01.1'W	3	6900			LS
	9	6/10	Union Co. Line Rd.	36°35.7'N 104°00.9'W	3	6900	3		LS
	10	4/18	mi. 2, Raton BBS	36°21.3'N 104°24.7'W	4	5950	5		LS
	11	6/2	3 mi. NNW Abbott	36°21.5'N 104°17.0'W	4	6285	3		LS

County	Site No.	Date	Site	Geo. Location	Map#	Elev. (ft.)	# Birds	Young	Reporter
(Colfax)	12	6/9	5 mi. S. Abbott	36°14.6'N 104°16.9'W	4	5940	6		H.R. Schwarz
	13	6/8	5 mi. SE Abbott	36°14.5'N 104°14.6'W	4	c. 6000	1		W.R. Maynard
	14	7/5	5 mi. S 5.5 mi. E. Abbott	36°13.9'N 104°09.3'W	4	6150	3	5	LS
	15	6/2	mi. 6-7 Farley BBS	36°23.3'N 104°03.6'W	4	6150	6		S.O. Williams III
	16	6/2	Farley Prairie Dog Town	36°28.4'N 104°03.1'W	4	6120	2		LS
	"	8/24	"	36°28.4'N 104°03.1'W	4	6120	(122)*		LS
Colfax County Totals							46	5	
Union	9	6/10	See #9 on previous page		3		4		LS
	17	5/3	Grenville Cemetery	36°35.8'N 103°36.6'W	5	5940	6		LS
	18	5/3	2 mi. S. Grenville	36°34.1'N 103°36.9'W	5	5910	2		LS
	19	6/2	(Sofia Rd.) W. Jct. NM 453 & Dirt	(W) 36°26.9'N 103°42.1'W	6	5940	5		LS
	"	6/2	"	(E) 36°27.1'N 103°39.5'W	6	6030	5		LS
	"	6/2	"	(S) 36°24.2'N 103°42.4'W	6	5980	3		LS
	20	6/1	14.5 mi. W Clayton N. of US56	(E) 36°23.0'N 103°25.0'W	7	5446	7	1	LS
	"	8/24	"	(W) 36°23.1'N 103°26.8'W	7	5460	(24)*		LS

County	Site No.	Date	Site	Geo. Location	Map #	Elev. (ft.)	# Birds	Young	Reporter
(Union)	21	5/31	Gilbert Ranch 7 mi. WSW Clayton	36°25.5'N 103°19.8'W	7	5180	1		LS
	22	5/31	Unit 27, KNG 5 mi. S. Clayton	36°21.9'N 103°09.9'W	7	4840	1		LS
	23	7/?	2 mi. NW Clayton	36°29.6'N 103°12.7'W	7	5150	2		W. Cook
Union County Totals							36	5	
McKinley	24	6/22	Star Lake	35°55.2'N 107°27.2'W	8	6650	2	2	LS
McKinley County Totals							2	2	
Sandoval	25	4/20	Santo Domingo	35°27.5'N 106°18.1'W	9	5700	5	2	LS
Sandoval County Totals							2	2	
Mora	26	5/19	Ft. Union Ranch	35°52.1'N 104°52.4'W	10	6600	6		LS
	27	6/10	5 mi. S. Wagon Mound	35°55.5'N 104°43.6'W	10	6220	4		LS
Mora County Totals							4	0	
Harding	28	6/8 7/5	Chicosa Lake	36°02.2'N 104°09.5'W	17	5830	1		W.R. Maynard
	29	7/5	6 mi. SSW Yates	36°03.4'N 103°56.1'W	11	5610	4	6	LS
	30	6/9	Rosebud BBS	35°50.6'N 103°25.4'W	12	4810	4		W.R. Maynard
Harding County Totals							9	6	
San Miguel	31	6/6	Maes Road	35°37.3'N 104°49.8'W	10	6610	4		LS
San Miguel County Totals							4	0	

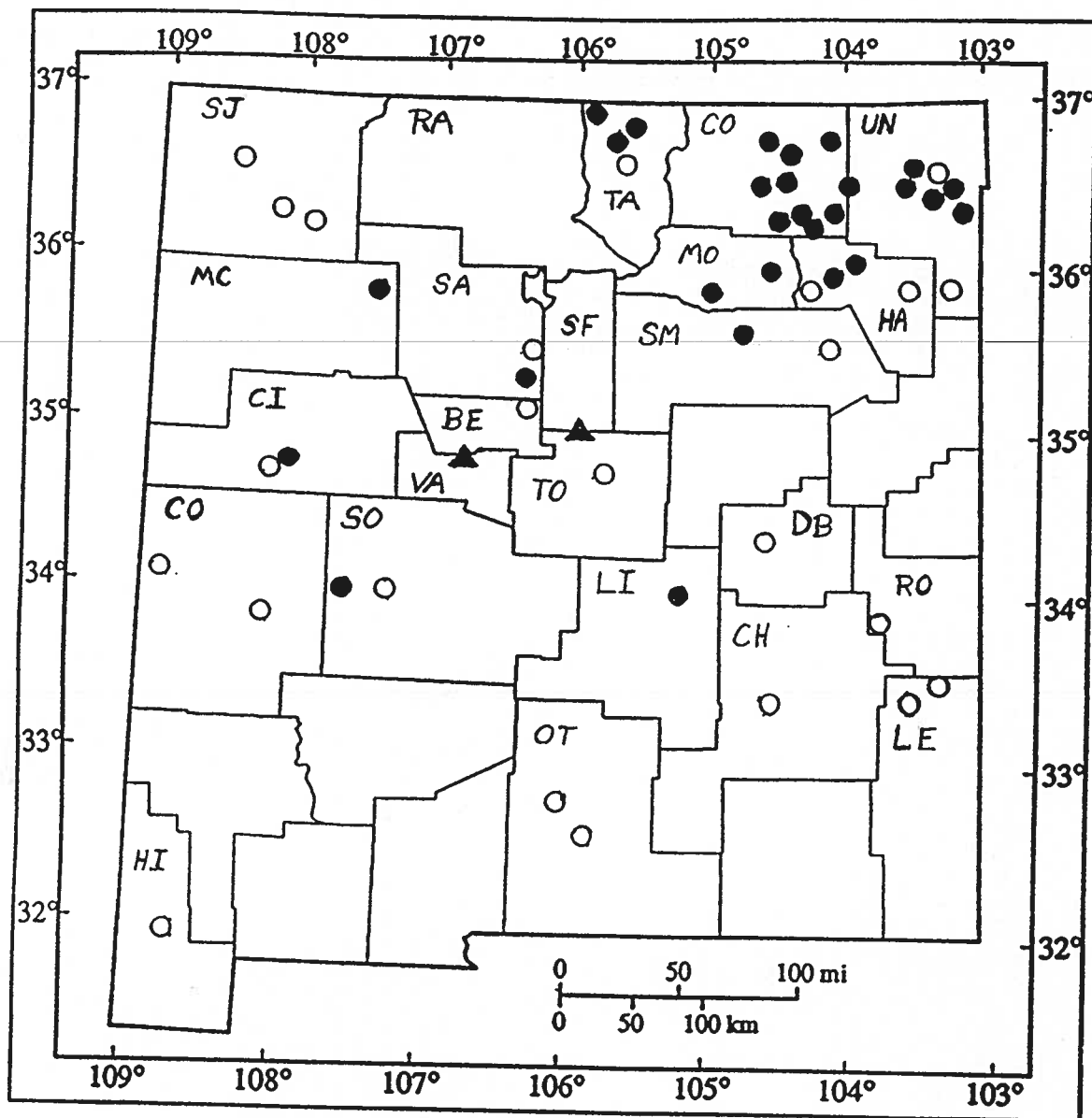
County	Site No.	Date	Site	Geo. Location	Map #	Elev. (ft.)	# Birds	Young	Reporter
Cibola	32	5/18	North Plains Fence Lake BBS	34°38.2'N 108°10.9'W	13	7200	7		S.O.Williams III
	33	6/22	Chain of Volcanoes	34°44.2'N 108°06.2'W	13	7170	3		LS
Cibola County		Totals				10		0	
Socorro	34	5/16	Datil BBS Augustine Wells	34°06.4'N 107°40.9'W	14	7000	6		LS
Socorro County		Totals				6			
Lincoln	35	6/11	Corona E. BBS	34°06.4'N 105°06.8'W	15	5300	1	2	D.H.Mehlman
Lincoln County		Totals				1		2	
State Totals						152		26	

* = Not included in breeding count

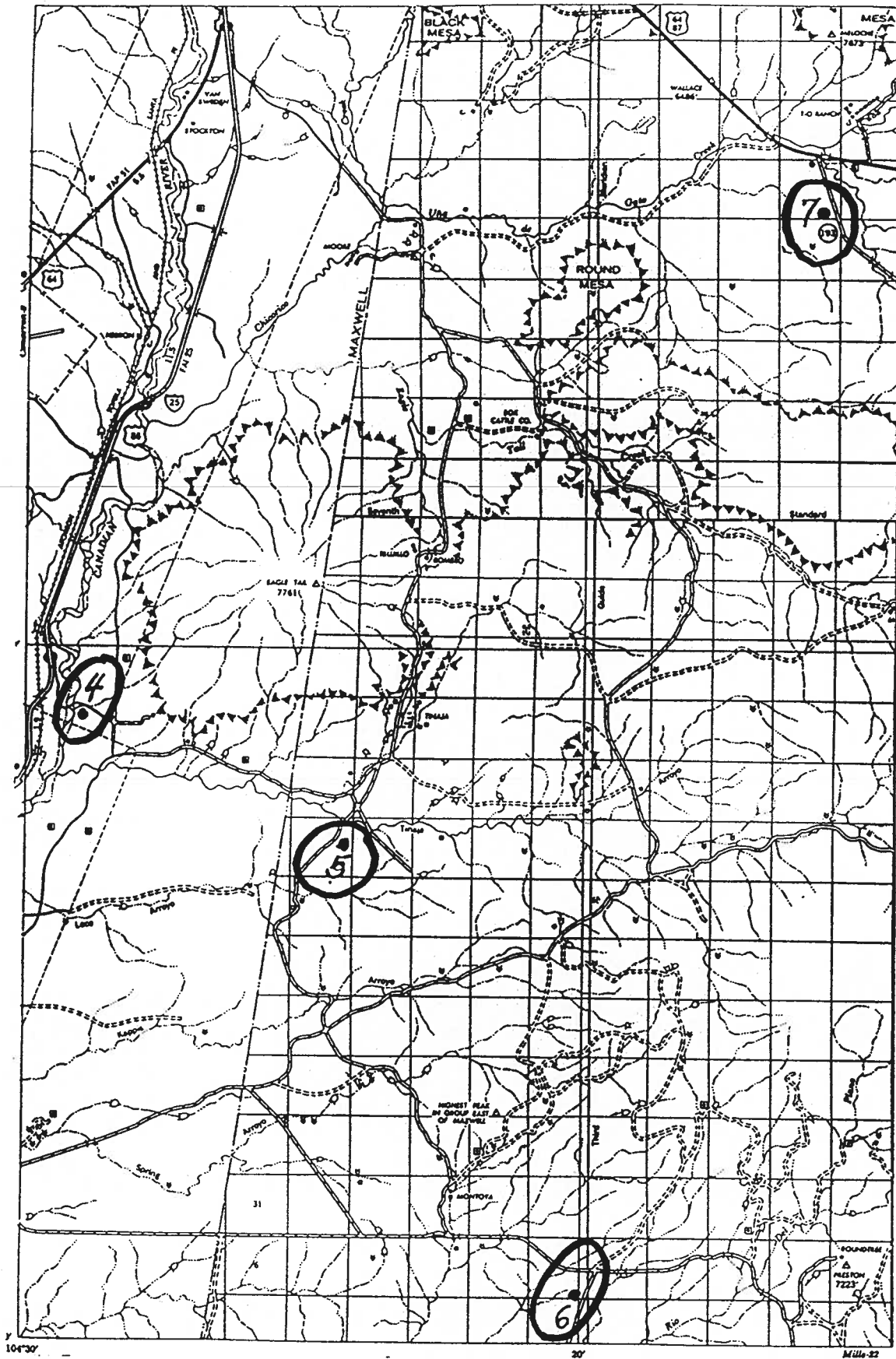
TABLE 2. 1995 Mountain Plover habitat characteristics in New Mexico by county and site

County	Site No	Fenced	Open Range	Habitat Description
Taos	1		X	Wide valley, shortgrass, scattered tall grass.
	2		X	Short, rolling hills, surrounding shortgrass playas.
	3		X	Wide "flats" between hills. Stony substrate.
Colfax	4		X	Wide bowl, bounded by trees at W edge.
	5	X		Hillside, gullied down to watercourse.
	6		X	Mesatop, scattered rabbitbrush and yucca.
	7	X		Crest of rise, shortgrass, scattered clumps of taller grasses.
	8	X		Low, rolling hills around large sink.
	9	X		Flat-topped short, steep hills.
	10	X	X	Wide valley, extensive reclamation earthworks
	11		X	Edge of stony mesatop
	12	X		Gently rolling hills around sloping valley, earthen tank.
	13	X		Short, rolling hills.
	14		X	Wide flat, homogeneous shortgrass.
	15	X		Homogeneous shortgrass, long slope to valley.
	16	X		Prairie dog town. Mostly bare ground.
Union	17	X		Wide depression, scattered rocks, rabbitbrush.
	18	X		Rock strewn slope, windmill. Scattered yucca, shrubs.
	19		X	Stony substrate, scattered shrubs, elevated RR embankment.

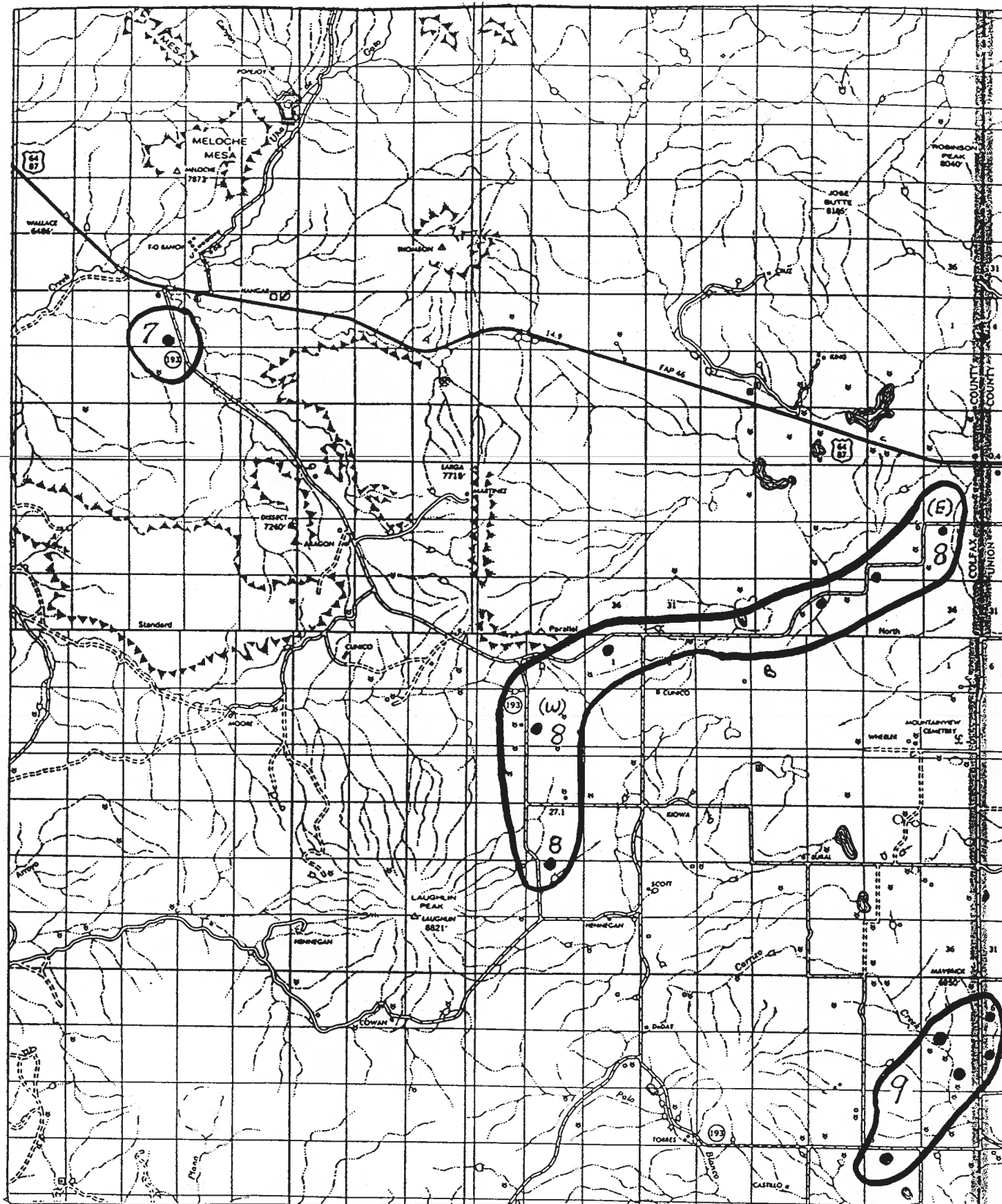
	20		X	Windmill tank atop mesa. Scattered yucca, taller grasses.
	21	X		Bare ground with scattered vegetation (ranch yard).
	22	X		Abandoned building close by. Not grazed; patches of short and tall grasses.
	23	X		Shortgrass mesatop, base of steep hillside.
McKinley	24		X	Shortgrass flat, Small (active?) prairie dog colony.
Sandoval	25	X		Shortgrass, with extensive rabbitbrush, snakeweed. Scattered yucca, cholla. A few juniper.
Mora	26	X		Windmill tank, on raised cow manure covered flat. Adjacent to Interstate Highway.
	27	X		Series of short ridges ending in wide depression.
Harding	28	X		Seasonal lake, relatively steep shoreline.
	29	X		Shortgrass, surrounded by taller grasses, scattered shrubs
	30	?	?	? No information available.
San Miguel	31		X	Shortgrass, clumps of taller grasses. Steeply sided "bowl" playa.
Cibola	32	X		Adjacent to highway. Short, steep hills, with bare rock strewn playas. Snakeweed.
	33		X	Playas with scattered lava rocks and outcroppings. Windmill and tank.
Socorro	34	X	X	Thin clumps of tall grasses, much bare ground in series of ridges. Yucca.
Lincoln	35	X	X	Ranch buildings. Bare ground/short grass, scattered cholla, yucca.



Map 1. New Mexico counties, indicating 1995 Mountain Plover sites (●), historic breeding records for the period 1864-1994 (○), and turf farms used by migrants (▲).
 Note: the 1995 survey effort focused on the northern half of the state, with limited survey effort in the south.

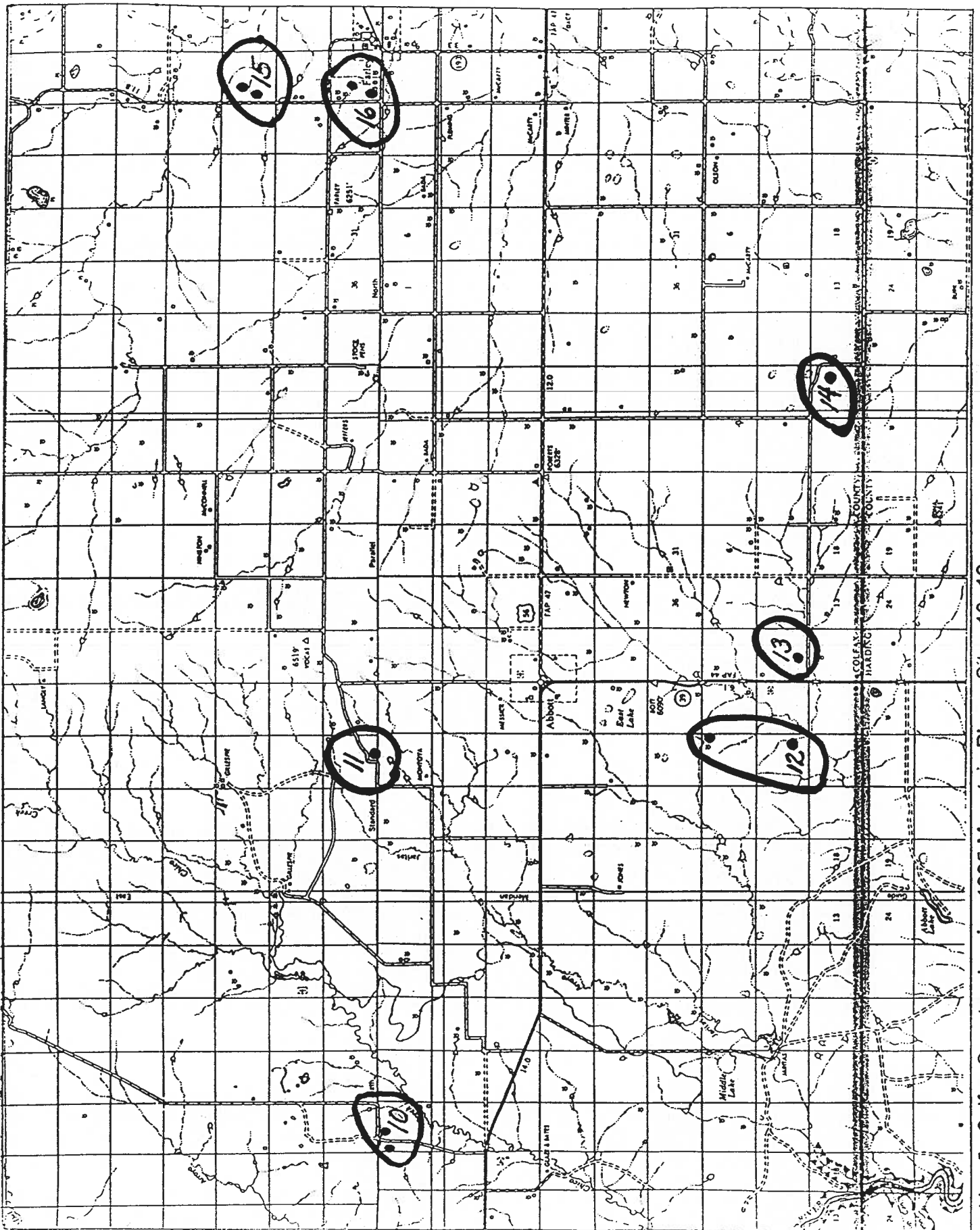


Map 3. Colfax County, showing 1995 Mountain Plover Sites 4 - 7.

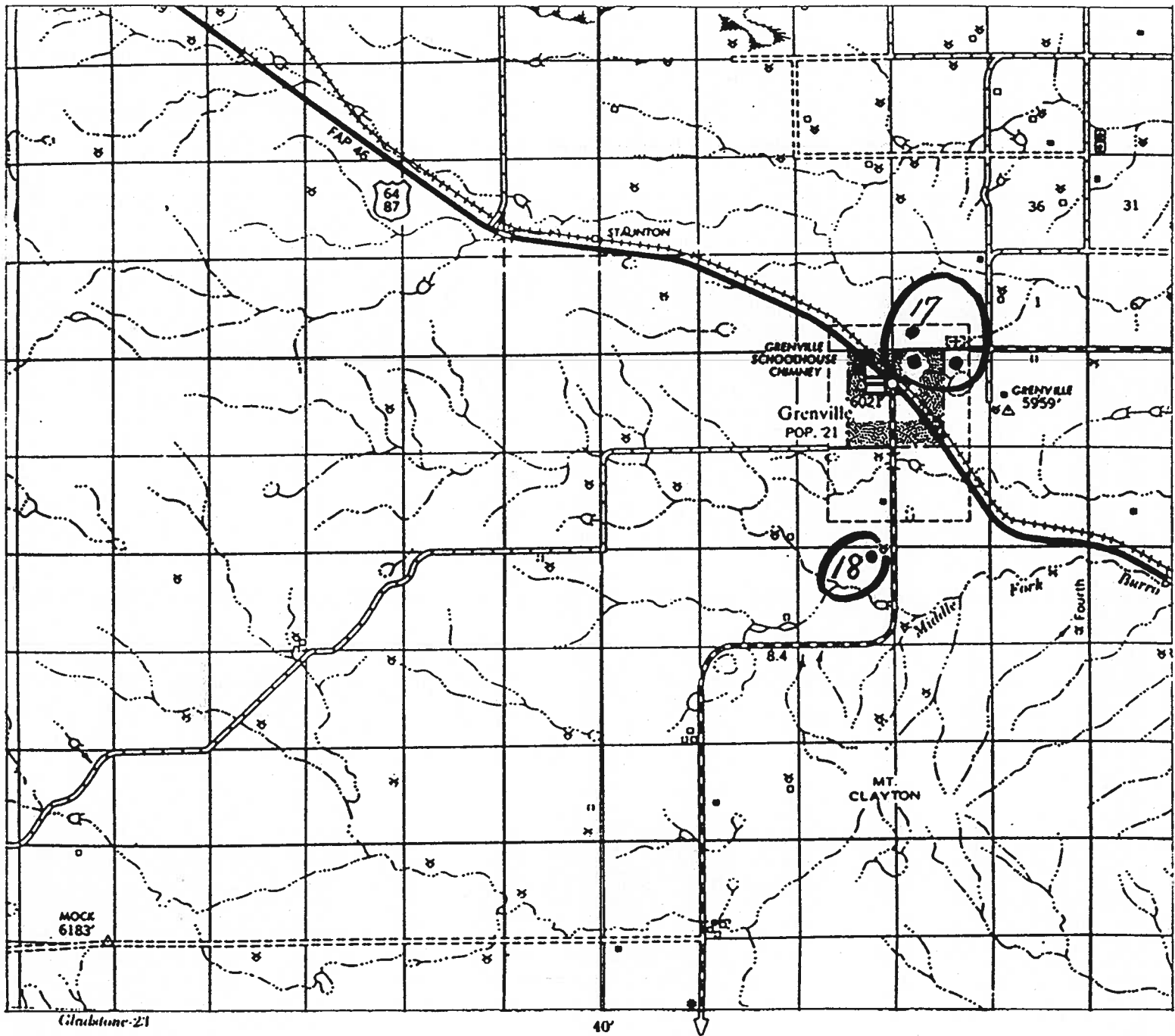


Map 4. Colfax County, showing 1995 Mountain Plover Sites 7 - 9 (Sites 8 and 9 are extended sites).

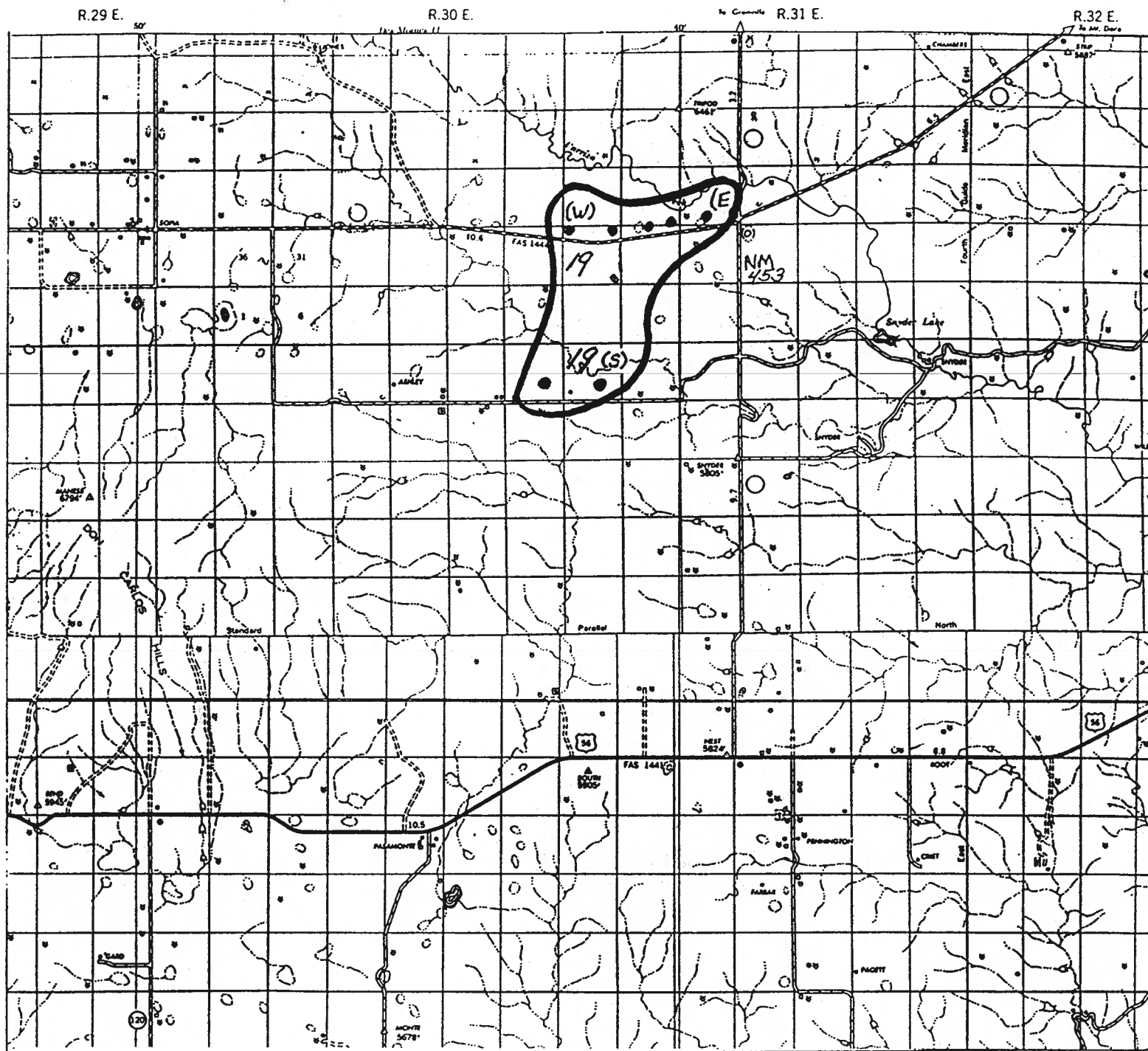
L. A. Sager



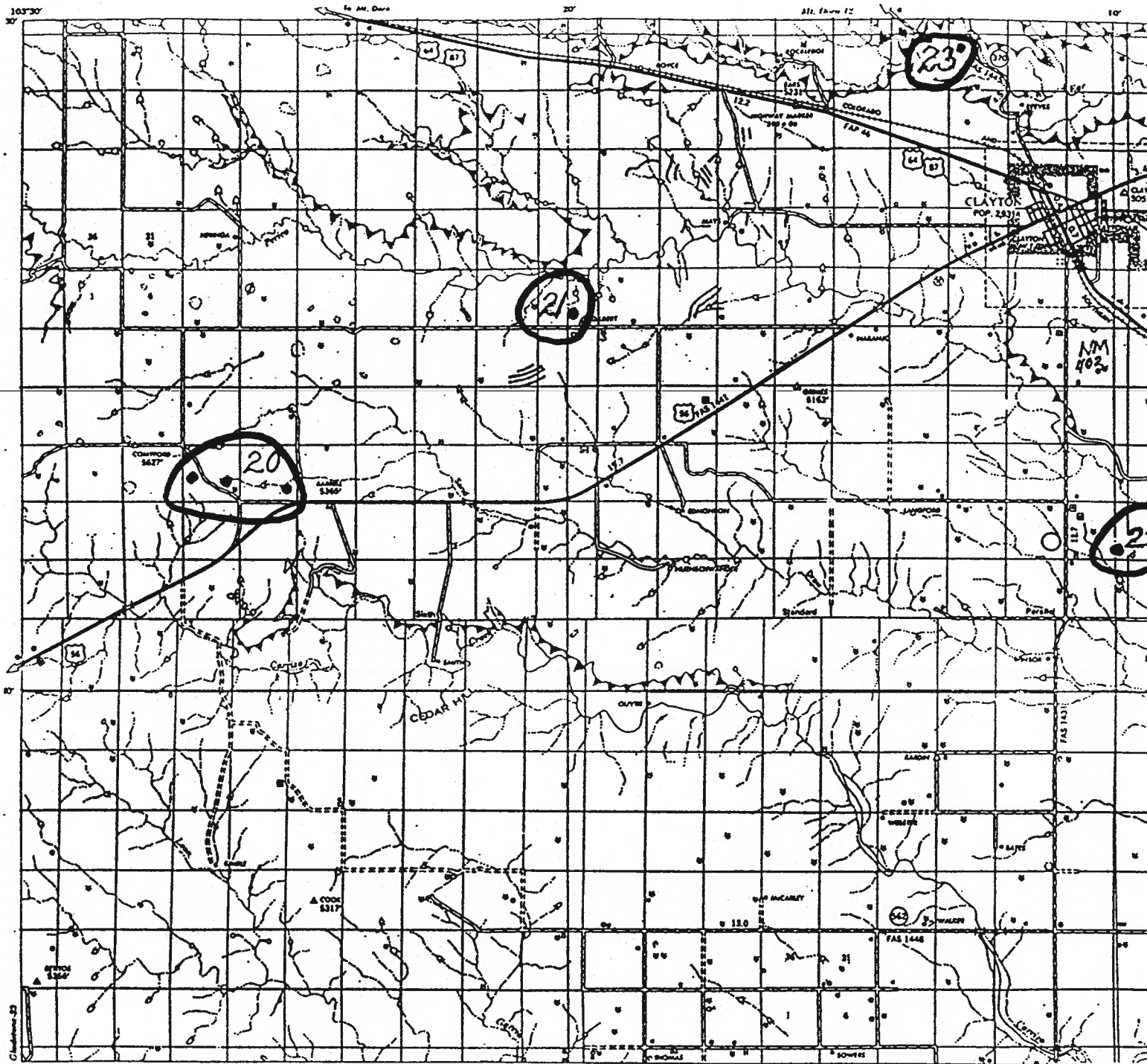
Map 5. Colfax County, showing 1995 Mountain Plover Sites 10 -16.



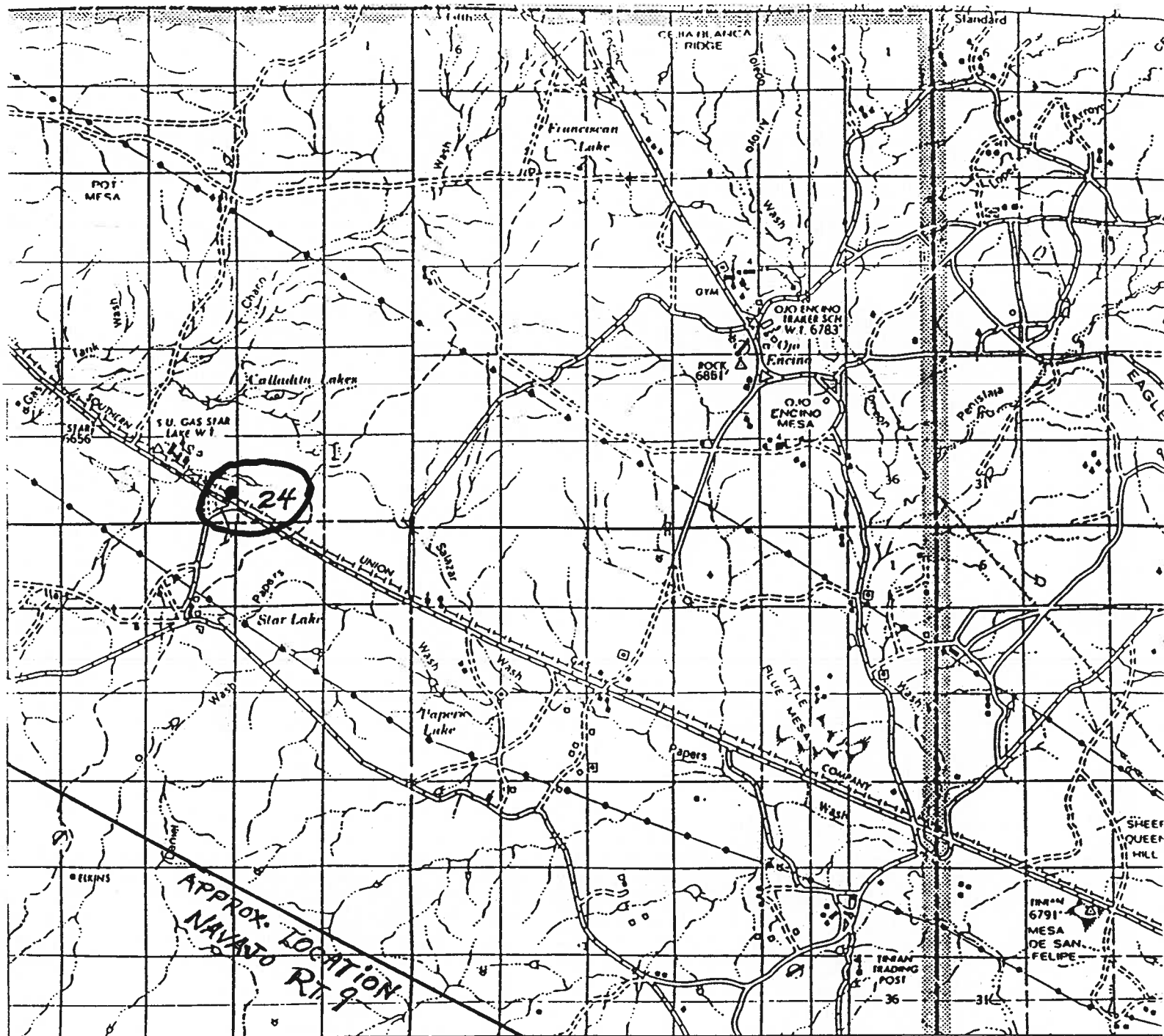
Map 6. Union County, showing 1995 Mountain Plover Sites 17 and 18.



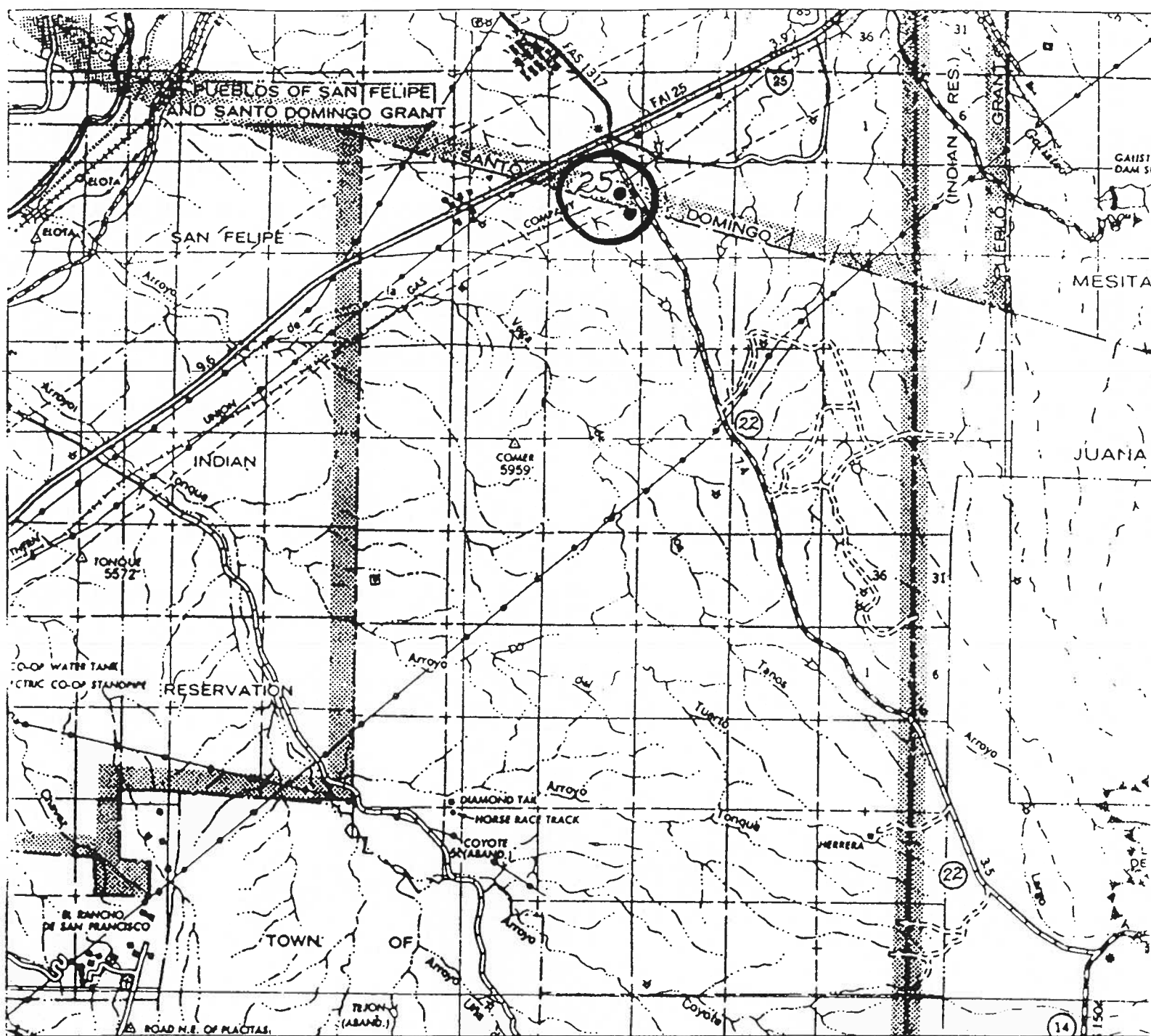
Map 7. Union County, showing 1995 Mountain Plover Sites 19 (extended site).



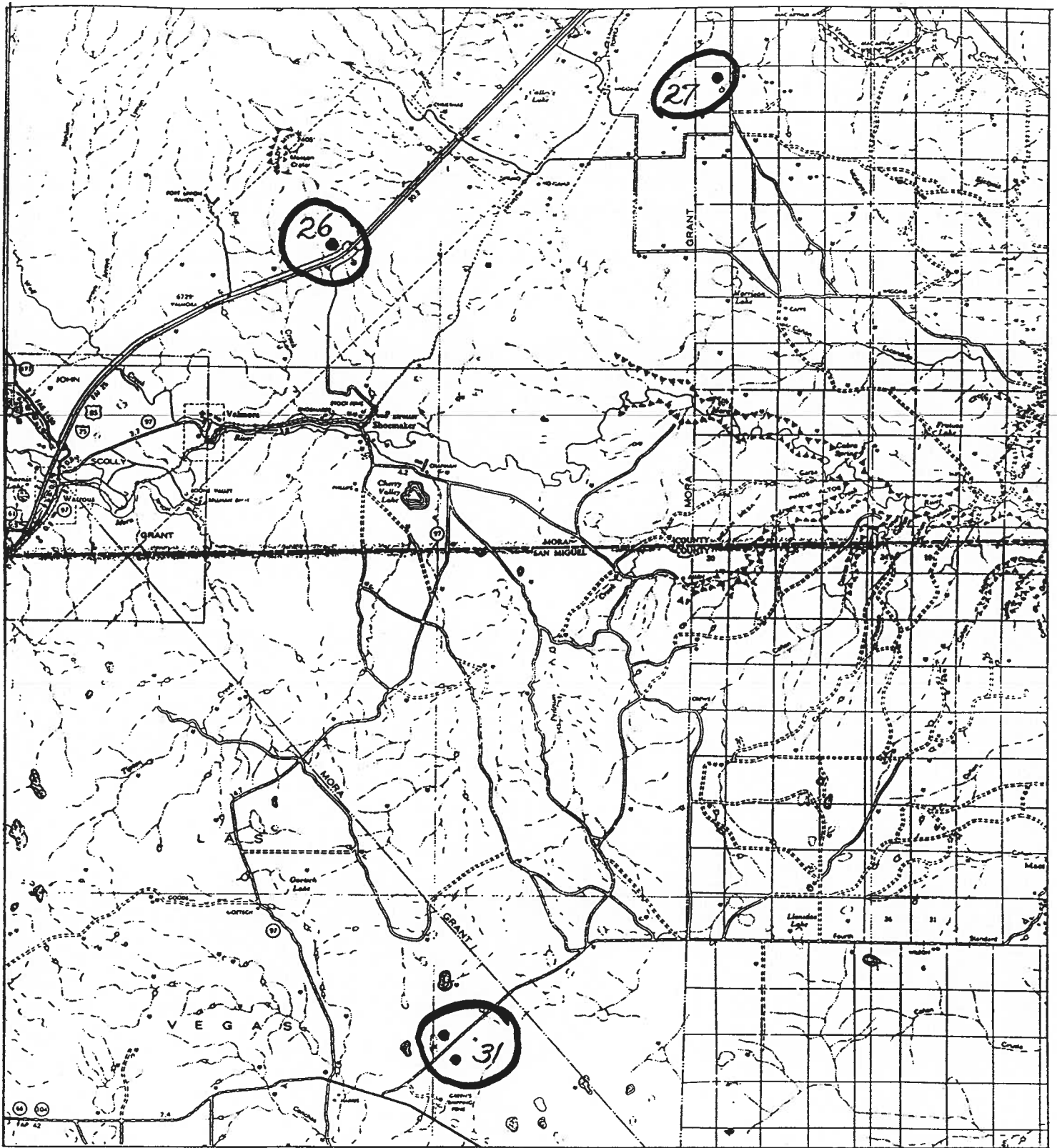
Map 8. Union County, showing 1995 Mountain Plover Sites 20 -23.



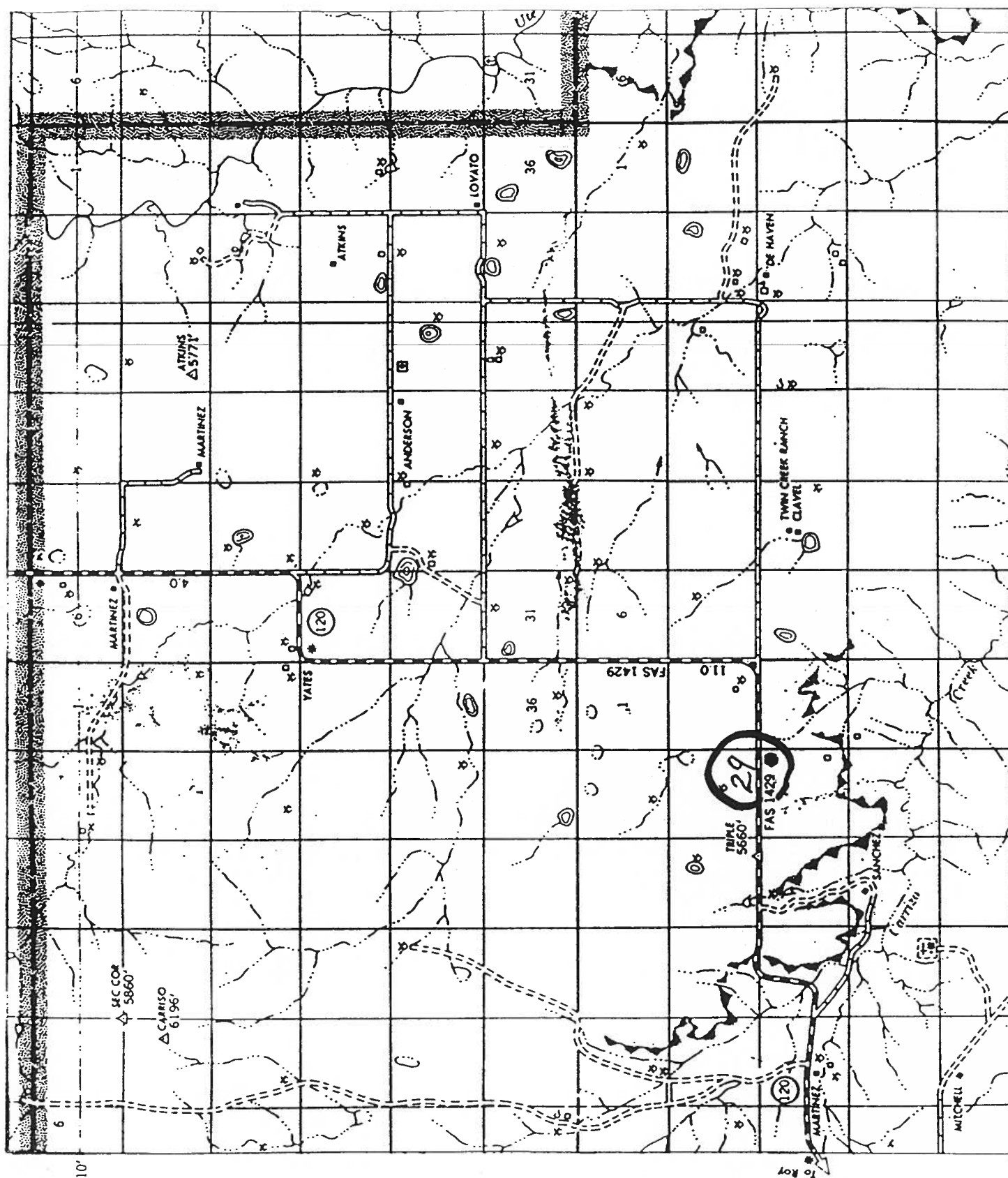
Map 9. McKinley County, showing 1995 Mountain Plover Site 24.



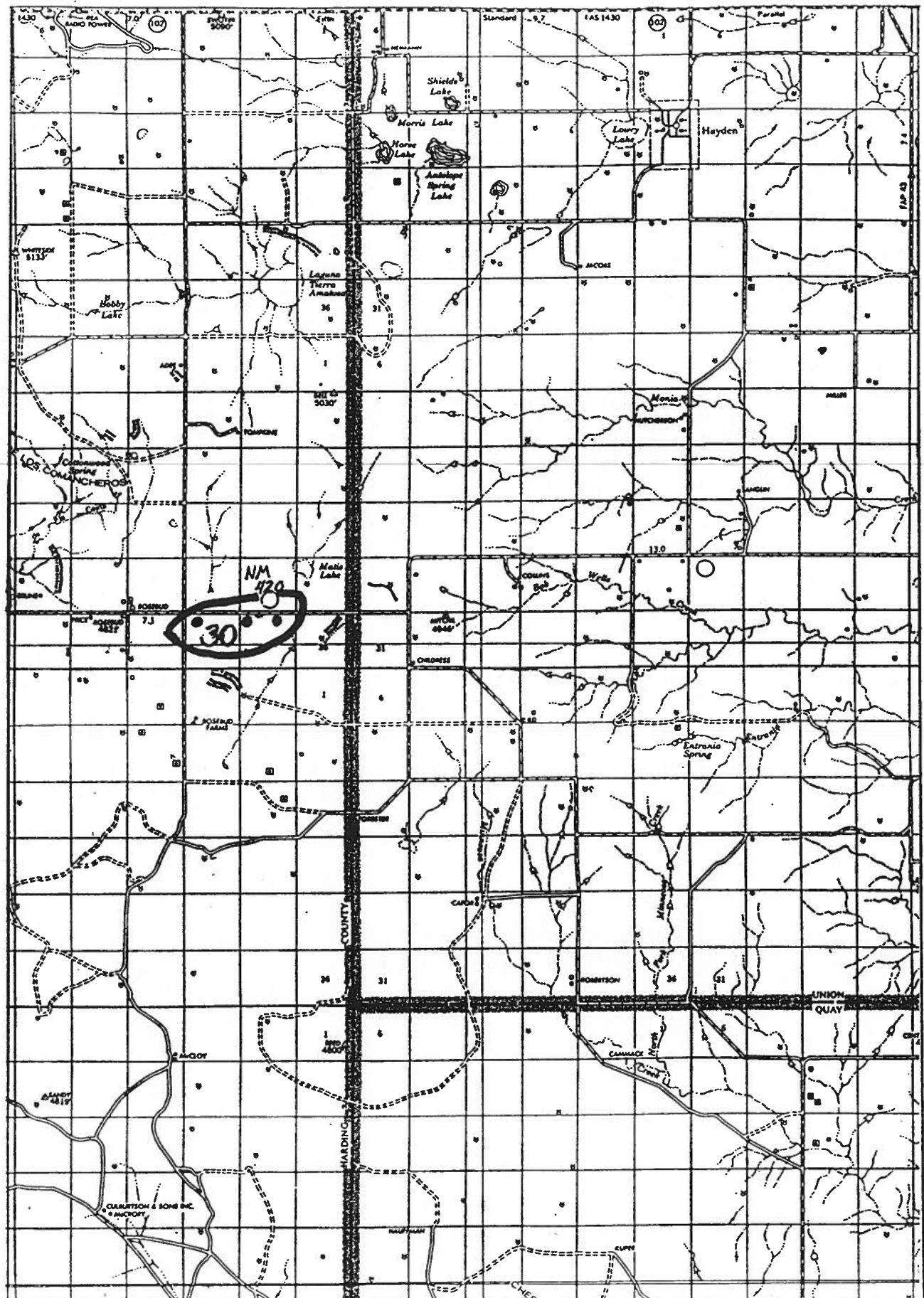
Map 10. Sandoval County, showing 1995 Mountain Plover Site 25.



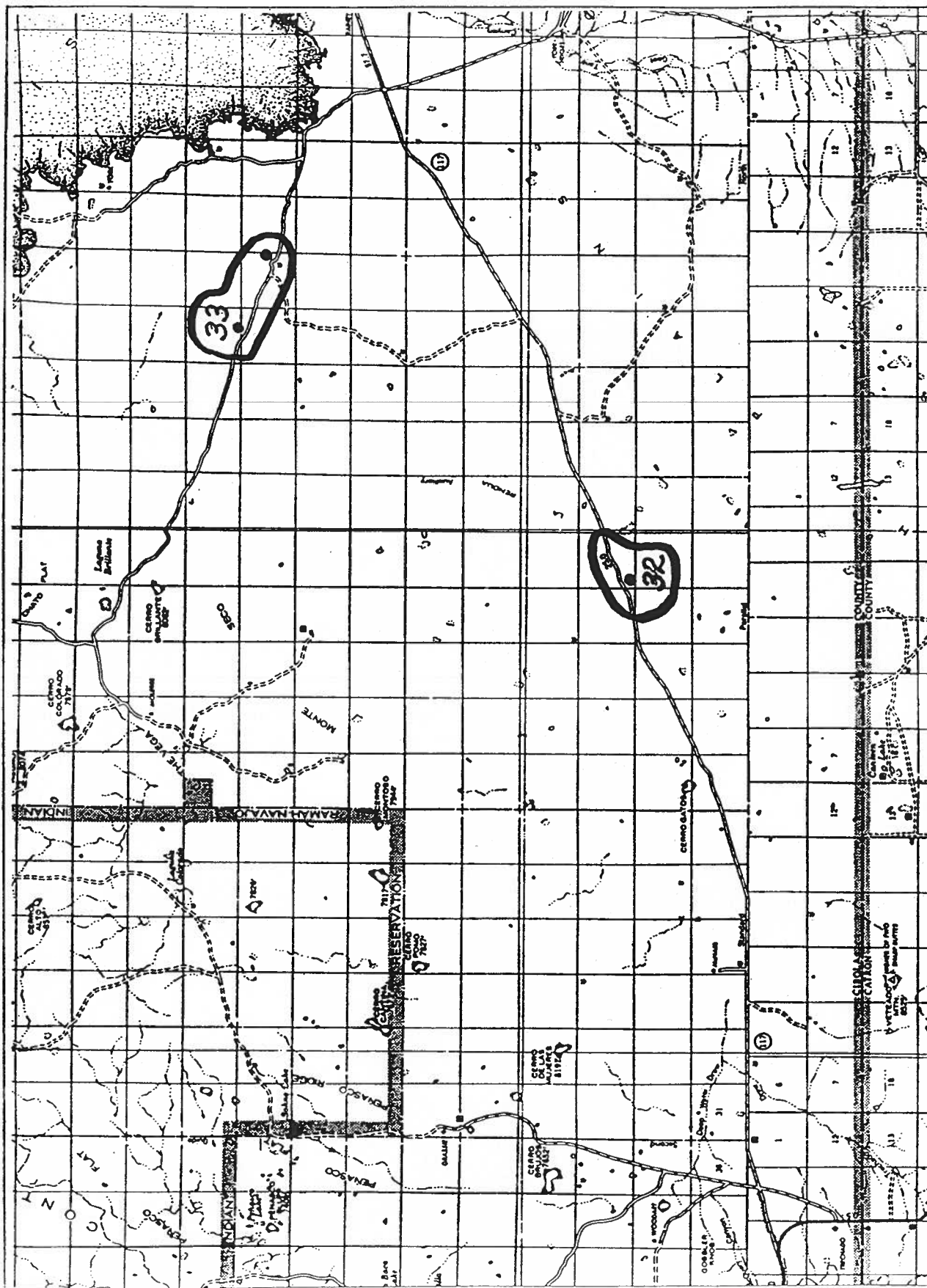
Map 11. Mora and San Miguel Counties, showing 1995 Mountain Plover Sites 26, 27, and 31.



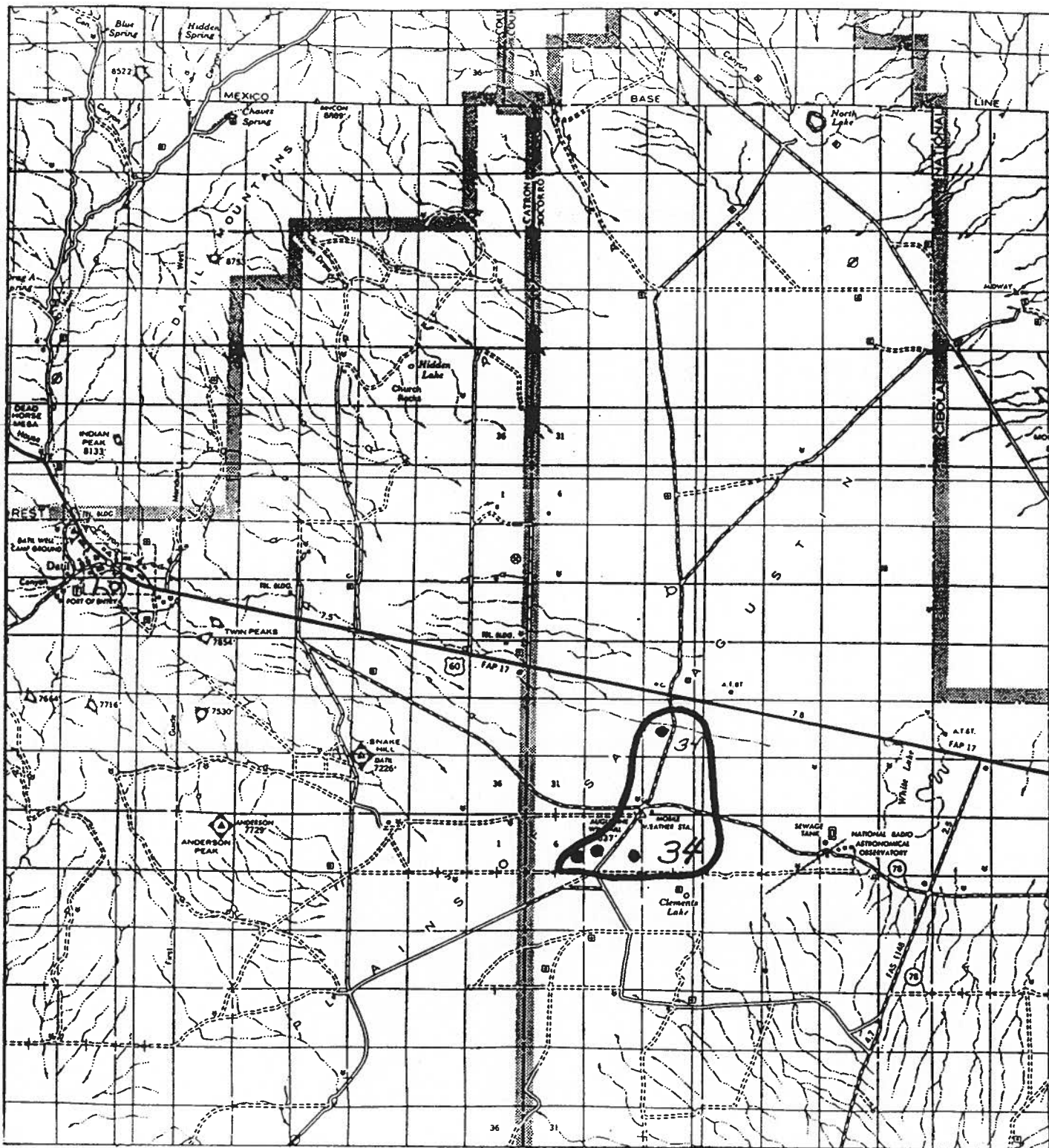
Map 12. Harding County, showing 1995 Mountain Plover Site 29.



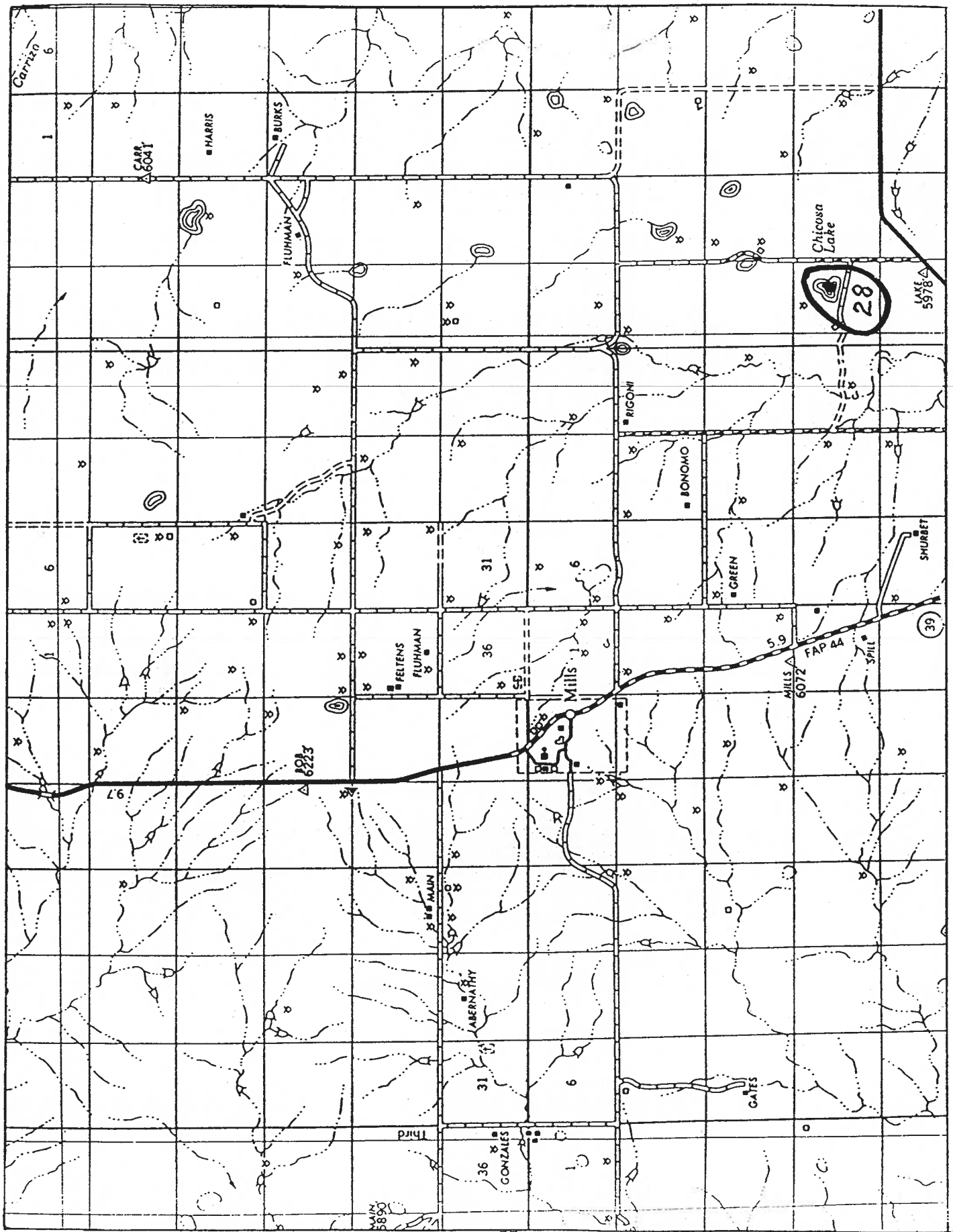
Map 13. Harding County, showing 1995 Mountain Plover Site 30.



Map 14. Cibola County, showing 1995 Mountain Plover Sites 32 and 33.



Map 15. Socorro County, showing 1995 Mountain Plover Site 34.



Map 17. Harding County, showing 1995 Mountain Plover Site 28.

Appendix A: 1995 Long-billed Curlew sightings.

County	Date	Location	No. Birds	No. Young
Colfax	5/10	Co. Rd.34, mile 1	2	
	5/10	Co. Rd.34, mile 2	1	(+ nest)
	5/10	Co. Rd.34, mile 10.2	3	
	6/7	~8 mi. NE Maxwell	2	
	6/7	Maxwell-Eagletail Rd.	2	
	7/5	Co. Rd.41, 3.5mi. S US 56	3	
	7/6	Co. Rd.C48,2mi. N US 56	1	
	7/6	Unit 101, Kiowa N.G.	1	
Union	5/3	US 56, mile 45	2	
	5/31	Heringa Rch. Rd.	4	
	5/31	Unit 147, Kiowa N.G.	2	
	5/31	Unit 27, Kiowa N.G.	5	(+1 salvage)
	6/1	NM562,~2mi. W NM402	2	
	6/2	14.5mi. W Clayton,N US 56	2	
	6/2	Snyder Rch. Rd.	2	
	6/8	NM 370, mile 30	1	
	6/8	Unit 50, Kiowa N.G.	5	
	6/8	Shields Lake	"several"	
	6/8	NM 102, Heimann Rch.	2	2
	6/8	Unit 24, Kiowa N.G.	1	
	6/8	Jct. NM 402 & 102	1	
	8/24	1 mile E Sofia	1	
Mora	5/1	Fort Union Rch. at I-25	6	
	7/4	NM 161, mile 16.5	1	
	7/24	NM 442, 3.5mi. N LaCueva	1	3
Harding	5/3	NM 120, mile 6, (N Roy)	1	
	5/10	~1 mile E Mills	1	
	5/30	NM102, mile 16	2	
	7/5	Chicosa Lake State Park	4	
Santa Fe	5/7	NM 472, ~2.5mi. W Stanley	1	
San Miguel	4/7	NM 104, miles 4-10	8	
	5/11	Maes Rch. Rd.	2	
	6/5	NM 104, mile 2.5	2	
Cibola	6/22	Co.Rd. 42 (Volcanoes Rd.)	1	
DeBaca	6/16	US 60, mile 302, E Yeso	2	
	6/16	Crossroads, 6.3mi.S Yeso	6	
Quay	6/17	NM 252, mile 37	2	
	6/17	NM 209, 3mi. E Ragland	2	
Chaves	6/17	Railroad Mt., S Kenna	2	1
Roosevelt	6/17	~2mi.SE Kenna (Tower)	4	

APPENDIX B: 1995 Burrowing Owl sightings.

County	Date	Location	No. Birds
San Juan	6/22	SE Burnham	"several"
	6/22	Tanner Lake	1
Taos	5/9	~2mi. W Arroyo Hondo	"a few"
Colfax	4/18	8.5mi. ENE Maxwell	2
	5/2	1mi. W Farley (p.dogs)	"several"
	6/10	NM 193, mile 9.5	1
	7/6	Unit 101, Kiowa N.G.	2
	7/25	Jct. I-25 & NM696	2
Union	5/31	Heringa Rch. Rd	1
	5/31	Unit 147, Kiowa N.G.	"several"
	6/1	Unit 27, Kiowa N.G.	1
	6/1	US 56, ~7mi. W Clayton	3
	8/24	NM 453, 2.3mi. N US 56	1 (salvage)
Mora	4/18	I-25, mile 382 (E side)	1
	7/24	NM 120, mile 31.5	1
Harding	5/10	NM 102, 12mi. S Bueyeros	1
	5/30	NM102, mile 3	2
	7/4	~10 mi. S Wagon Mound	1
McKinley	6/22	Star Lake	1
Santa Fe	5/15	Co.Rd.8, ~0.5mi. W NM 41	1
	6/2	NM 14 S Penitentiary	2
San Miguel	5/11	NM 104, mile 5.5	1
	5/11	NM 104, mile 10.5	1
	6/5	Maes Rch.Rd., mile 7.5	1
Cibola	6/22	NM 117, mile 15	1
Torrance	4/16	NM 41, Estancia area	"abundant"
	6/16	US 60, Lucy	2
DeBaca	6/16	Gramma Valley, S Yeso	1
Quay	6/17	NM 252, mile 10.4	1
	6/17	NM 252, mile 35	1
	6/17	NM 252, mile 37	1
	6/17	NM 268, mile 19.5	1
Lincoln	6/30	NM 247, ~30mi. E Corona	1
	6/30	NM247, mile 46.6	2
Chaves	6/17	2 miles W White Lake	1